

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

**JOINT APPLICATION OF LOUISVILLE GAS)
AND ELECTRIC COMPANY AND KENTUCKY)
UTILITIES COMPANY FOR REVIEW,)
MODIFICATION, AND CONTINUATION OF) **CASE NO. 2014-00003**
EXISTING, AND ADDITION OF NEW,)
DEMAND-SIDE MANAGEMENT AND ENERGY)
EFFICIENCY PROGRAMS)**

JOINT APPLICATION

Louisville Gas and Electric Company (“LG&E”) and Kentucky Utilities Company (“KU”) (collectively “the Companies”) hereby petition the Kentucky Public Service Commission (“Commission”) pursuant to KRS 278.285 to issue an Order approving their proposed 2015-2018 Demand-Side Management and Energy Efficiency Program Plan (“Proposed DSM/EE Program Plan”) and the proposed Demand Side Management (“DSM”) cost recovery tariffs filed herein that will permit recovery of the costs associated with the proposed programs. The Companies respectfully ask the Commission to issue a final order in this proceeding by November 17, 2014, with the Companies’ revised tariff sheets to be effective on January 1, 2015.

In support of this Joint Application, the Companies respectfully state:

1. Addresses: Applicant LG&E’s full name and post office address is: Louisville Gas and Electric Company, 220 West Main Street, Post Office Box 32010, Louisville, Kentucky 40202.

Applicant KU’s full name and business address is: Kentucky Utilities Company, One Quality Street, Lexington, Kentucky 40507. KU’s mailing address is Kentucky Utilities

Company c/o Louisville Gas and Electric Company, 220 West Main Street, Post Office Box 32010, Louisville, Kentucky 40202.

The Companies may be reached by electronic mail at the electronic mail addresses of their counsel set forth below.

2. Corporate Status and Articles of Incorporation. Certified copies of LG&E's and KU's current Articles of Incorporation are on file with the Commission in Case No. 2010-00204, *In the Matter of: Joint Application of PPL Corporation, E.ON AG, E.ON U.S. Investments Corp., E.ON U.S. LLC, Louisville and Gas Electric Company and Kentucky Utilities Company for Approval of an Acquisition of Ownership and Control of Utilities*, which Articles were filed in that proceeding on May 28, 2010, and are incorporated by reference herein pursuant to 807 KAR 5:001 § 14(2).

LG&E is incorporated in the Commonwealth of Kentucky and is in good corporate standing, as attested by the Certificate of Existence from the Kentucky Secretary of State attached hereto as Exhibit 1. LG&E was incorporated in Kentucky on July 2, 1913.

KU is incorporated in the Commonwealth of Kentucky and the Commonwealth of Virginia and is in good corporate standing in both states, as attested by the Certificate of Existence from the Kentucky Secretary of State and the Certificate of Good Standing from the Virginia State Corporation Commission, which certificates are collectively attached hereto as Exhibit 2. KU was incorporated in Kentucky on August 17, 1912, and in Virginia on November 26, 1991.

3. LG&E is a public utility, as defined in KRS 278.010(3)(a), engaged in the electric and gas business. LG&E generates and purchases electricity, and distributes and sells electricity at retail in Jefferson County and portions of Bullitt, Hardin, Henry, Meade, Oldham, Shelby,

Spencer, and Trimble Counties. LG&E also purchases, stores and transports natural gas and distributes and sells natural gas at retail in Jefferson County and portions of Barren, Bullitt, Green, Hardin, Hart, Henry, Larue, Marion, Meade, Metcalfe, Nelson, Oldham, Shelby, Spencer, Trimble, and Washington Counties.

4. KU is a public utility, as defined in KRS 278.010(3)(a), engaged in the electric business. KU generates and purchases electricity, and distributes and sells electricity at retail in the following counties in Central, Northern, Southeastern, and Western Kentucky:

Adair	Edmonson	Jessamine	Ohio
Anderson	Estill	Knox	Oldham
Ballard	Fayette	Larue	Owen
Barren	Fleming	Laurel	Pendleton
Bath	Franklin	Lee	Pulaski
Bell	Fulton	Lincoln	Robertson
Bourbon	Gallatin	Livingston	Rockcastle
Boyle	Garrard	Lyon	Rowan
Bracken	Grant	Madison	Russell
Bullitt	Grayson	Marion	Scott
Caldwell	Green	Mason	Shelby
Campbell	Hardin	McCracken	Spencer
Carlisle	Harlan	McCreary	Taylor
Carroll	Harrison	McLean	Trimble
Casey	Hart	Mercer	Union
Christian	Henderson	Montgomery	Washington
Clark	Henry	Muhlenberg	Webster
Clay	Hickman	Nelson	Whitley
Crittenden	Hopkins	Nicholas	Woodford
Daviess			

5. Copies of all orders, pleadings and other communications related to this proceeding should be directed to:

Edwin "Ed" R. Staton
Vice President, State Regulation and Rates
LG&E and KU Services Company
220 West Main Street
Louisville, Kentucky 40202
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Kendrick R. Riggs
W. Duncan Crosby III
Joseph T. Mandlehr
Stoll Keenon Ogden PLLC
2000 PNC Plaza
500 West Jefferson Street
Louisville, Kentucky 40202
Telephone: (502) 333-6000
kendrick.riggs@skofirm.com
duncan.crosby@skofirm.com
joseph.mandlehr@skofirm.com

Current Demand-Side Management/Energy Efficiency Programs

6. The Companies' initial Demand-Side Management and Energy Efficiency ("DSM/EE") programs were implemented in 1994. Since then, the Companies have worked with their Energy Efficiency Advisory Group ("EE Advisory Group"), a group of customer-stakeholders that includes the Attorney General and low-income advocates, to grow and improve the Companies' set of DSM/EE offerings, obtaining Commission approval for those offerings in 1996, 1998, 2001, 2008, and 2011.

7. Today, the Companies have a suite of successful DSM/EE programs, which the Commission approved in its November 9, 2011 Order in Case No. 2011-00134.¹ The Companies' current DSM/EE programs and the dates through which the Commission has approved them are:

¹ *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New Demand-Side Management and Energy-Efficiency Programs*, Case No. 2011-00134, Order (Nov. 9, 2011).

Approved through the end of 2018

Smart Energy Profile Program

Residential Refrigerator Removal Program

Residential Incentive Program

Program Development and Administration

Residential Conservation/Home Energy Performance Program

Residential Low Income Weatherization Program (“WeCare”)

Residential and Commercial Load Management/Demand Conservation

Commercial Conservation/Commercial Incentives Program

Approved through the end of 2014

Residential High Efficiency Lighting

Residential New Construction

Residential and Commercial HVAC Diagnostic and Tune-up

Customer Education and Public Information

Dealer Referral Network

8. Through November 2013, the Companies’ DSM/EE programs have produced cumulative energy and gas savings of approximately 650 GWh and 2 million ccf, along with a cumulative demand reduction of 331 MW. In accordance with past practice, the Companies’ 2014 Integrated Resource Plan (“IRP”) will include not only these already-achieved demand reductions, but also the projected demand reductions from the Proposed DSM/EE Program Plan.

**The Companies Now Propose to Build on their DSM/EE Success in Accordance with
Commission Orders and the Companies' Research**

9. The Commission has repeatedly expressed its clear policy to promote greater development and deployment of DSM/EE programs. In its February 17, 2011 Final Order in Case No. 2010-00222, the Commission stated:

The Commission believes that conservation, energy efficiency and DSM, generally, will become more important and cost-effective as there will likely be more constraints placed upon utilities whose main source of supply is coal-based generation.

...

[T]he Commission believes that it is appropriate to strongly encourage Meade, and all other electric energy providers, to make a greater effort to offer cost-effective DSM and other energy efficiency programs.²

Just over a year later, the Commission directed the Companies to conduct a study in their service territories to determine the potential for additional demand and energy savings through DSM/EE: “[The Companies] shall file with the Commission the [DSM/EE] potential or market characterization study as recommended in the ICF Report.”³

10. In addition to responding to the Commission’s orders, the Companies have continued to engage in DSM/EE program evaluation, measurement, and verification (“EM&V”) to provide increasingly beneficial programming.

11. In response to the Commission’s order and as part of the Companies’ own EM&V processes, the Companies commissioned The Cadmus Group, Inc. (“Cadmus”) to perform two studies concerning the Companies’ current and future DSM/EE programming. The first such

² *In the Matter of: Application of Meade County Rural Electric Cooperative Corporation to Adjust Electric Rates*, Case No. 2010-00222, Order at 15-16 (Feb. 17, 2011).

³ *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity and Site Compatibility Certificate for the Construction of a Combined Cycle Combustion Turbine at the Cane Run Generating Station and the Purchase of Existing Simple Combustion Turbine Facilities from Bluegrass Generation Company, LLC in LaGrange, Kentucky*, Case No. 2011-00375, Order at 18-21 (May 3, 2012).

study is the *Energy Efficiency Potential Study* (“*EE Potential Study*”), which is Exhibit MEH-3 to the testimony of Michael E. Hornung in this proceeding. The Companies commissioned the *EE Potential Study* to comply with the Commission’s Order in Case No. 2011-00375 quoted above. The *EE Potential Study* involved separate assessments of energy-efficiency potential for electricity and natural gas in the residential and commercial sectors, considering a wide range of energy-efficiency technologies. Results indicate a range of 941 GWh to 1,478 GWh of achievable electricity savings, representing 3.9% to 6.1% of forecasted retail sales in 2033, and a range of 15 million to 26 million therms of achievable natural gas savings, representing 5% to 9% of forecasted retail sales in 2033. As noted in the *EE Potential Study*, the Companies are currently on track to exhaust their achievable energy-efficiency potential by 2018.

12. The second study the Companies commissioned Cadmus to perform is the *Louisville Electric and Gas/Kentucky Utility Company DSM Program Review* (“*Program Review*”), which is Exhibit MEH-2 to Mr. Hornung’s testimony. Cadmus performed the *Program Review* contemporaneously with the *EE Potential Study*, and in consultation with the Companies’ EE Advisory Group. The *Program Review* involved consideration of the Companies’ existing programs, a gap analysis to identify any potential new program measures and delivery options, secondary research of program topics, and development of recommendations for each program moving forward. Overall, the *Program Review* revealed that the Companies currently offer well-designed and efficiently administered programs that already adhere to many industry standard best practices and produce reliable energy savings and demand reductions. The *Program Review* further offered a number of recommendations for enhancing or ending certain programs, which recommendations the Companies took into account in their

Proposed DSM/EE Program Plan. (The Proposed DSM/EE Program Plan is Exhibit MEH-1 to Mr. Hornung's testimony.)

13. The Proposed DSM/EE Program Plan is supported by the aforementioned studies, and was formulated in collaboration with the Companies' EE Advisory Group. The Companies held meetings with the EE Advisory Group in December 2012, June 2013, and October 2013 to discuss the *EE Potential Study* and the ongoing internal efforts to review the existing DSM/EE portfolio and develop the Proposed DSM/EE Program Plan. (The Companies invited the Attorney General's representatives to attend the EE Advisory Group meetings, but they were unable to attend.)

**The Proposed 2015-2018 Demand-Side Management and
Energy Efficiency Program Plan**

14. The Companies are proposing enhancements to their Commercial Load Management/Demand Conservation Program, Residential Incentives Program, Commercial Conservation/Commercial Incentives Program, and Residential Conservation/Home Energy Performance Program. The Companies are further proposing to enhance the Customer Education and Public Information Program and to extend it through the end of 2018 (its current approval extends through the end of 2014). The Companies are also proposing to deploy Advanced Metering Systems.

15. The Proposed DSM/EE Program Plan will maintain and operate the following programs according to their current Commission-approved designs through 2018: Smart Energy Profile Program, Residential Load Management/Demand Conservation, Residential Refrigerator Removal Program, Program Development and Administration, and Residential Low Income Weatherization Program (WeCare).

16. The Companies will allow the following programs to expire because they will have reached the end of their approval cycle and useful life by the end of 2014: Residential High Efficiency Lighting, Residential New Construction, Residential and Commercial HVAC Diagnostic and Tune-Up, and the Dealer Referral Network. The support for each program's expiration is in Exhibit MEH-1, Appendix A.

17. The Companies applied to their existing DSM/EE programs the industry-standard cost-benefit tests set out in the California Standard Practice Manual, which the Commission explicitly requires utilities to apply: "Any new DSM program or change to an existing DSM program shall be supported by ... [t]he results of the four traditional DSM cost-benefit tests [Participant, Total Resource Cost, Ratepayer Impact, and Utility Cost tests]." ⁴ Each of the programs in the Proposed DSM/EE Program Plan except the Advanced Metering Systems passed the Participant and Total Resource Cost tests (when applicable), and the overall portfolio passed the Participant, Utility Cost, and Total Resource Cost tests. For reasons explained in the testimony of David E. Huff, the Companies did not apply the California tests to the Advanced Metering Systems.

18. The Companies project that the effect of all of their past and current DSM/EE programs, as well as those in the Proposed DSM/EE Program Plan, will be a cumulative demand reduction of 500 MW and cumulative energy and gas savings of 1.6 million MWh and nearly 13.4 million ccf by 2018. To achieve these benefits, the Companies project a total DSM/EE portfolio and Advanced Metering Systems cost of \$179 million from 2015 to 2018. The amount approved by the Commission in Case No. 2011-00134 for years 2015 to 2018 is \$155 million. The Companies are requesting an additional \$24 million in this proposal to support modifications

⁴ *In the Matter of the Joint Application of the Members of the Louisville Gas and Electric Company Demand-Side Management Collaborative for the Review, Modification, and Continuation of the Collaborative, DSM Programs, and Cost Recovery Mechanism*, Case No. 1997-00083, Order at 20 (April 27, 1998).

to the Commercial Load Management Program/Demand Conservation Program, Residential Incentives Program, Commercial Conservation/Commercial Incentive Program, and Residential Conservation Program/Home Energy Performance Program. These funds will also support the continuation of the Companies' Customer Education and Public Information Program through the end of 2018, as well as the implementation of Advanced Metering Systems.

Advanced Metering Systems

19. The Companies commissioned a study by DNV KEMA Energy and Sustainability ("DNV KEMA") to evaluate the prospects and potential features of Advanced Metering Systems in the Companies' service territories. The resulting *LG&E and KU Smart Meter Business Case Assessment* ("*Smart Meter Study*") indicated that the Companies may have opportunities to benefit from targeted deployments of Advanced Metering Systems, but that system-wide conversion is not justified at this time based on the data analyzed. (The *Smart Meter Study* is Exhibit DEH-1 to the testimony of David E. Huff in this proceeding.) The Companies commissioned the study as part of their ongoing study of advanced metering and consistently with the Commission's final order in Case No. 2011-00440, which permitted LG&E to end its three-year responsive-pricing pilot for residential and general-service customers.⁵

20. On the basis of the *Smart Meter Study*, the Companies propose to add the Advanced Metering Systems, which will allow up to 5,000 LG&E and 5,000 KU residential and small commercial customers (i.e., Rates RS and GS) to choose to have an advanced meter installed on a purely optional first-come-first-serve basis. The goal of the Advanced Metering Systems is to put in place the communications and control infrastructure necessary for possible future advanced-meter deployments, as well as to provide participating customers more detailed

⁵ *In the Matter of: Request of Louisville Gas and Electric Company to Cancel and Withdraw the Tariffs for Its Responsive Pricing and Smart Metering Pilot Program*, Case No. 2011-00440, Order at 9-10 (Mar. 22, 2012).

information about their consumption. This goal is consistent with KRS 278.285(1)(h), which requires the Commission to consider when reviewing a utility's proposed DSM-EE plan, "Next-generation residential utility meters that can provide residents with amount of current utility usage, its cost, and can be capable of being read by the utility either remotely or from the exterior of the home."

21. The Companies propose to recover the capital costs of the Advanced Metering Systems through the capital component of their DSM-EE Cost-Recovery Mechanisms (i.e., the DCCR component). The Companies will recover the operating costs of the Advanced Metering Systems through the mechanisms' DCR component.

DSM Tariff Matters

22. The DSM Cost Recovery Mechanism ("DSM Mechanism") is the means to recover all applicable costs related to DSM/EE programs approved by the Commission. The DSM Mechanism has operated successfully from a rate mechanism standpoint for many years, providing customers a clear and certain line item on their bills for the Companies' DSM/EE programs. The Companies do not propose any changes to the DSM Mechanism other than to adjust the rates to account for the Proposed DSM/EE Program Plan. This will include recovering capital costs associated with the proposed Advanced Metering Systems through the DSM Capital Cost Recovery component.

23. The Companies propose minor changes to the descriptive language contained in the Programmatic Customer Charges section of the Companies' tariff sheets. These proposed changes to the descriptions of the Companies' DSM/EE programs and the incentives available to customers who participate reflect the changes in the Proposed DSM/EE Program Plan.

24. Clean and redlined versions of the Companies' revised tariff sheets reflecting all of the changes discussed above, as well as the supporting calculations for revised sheets, are

Exhibits RMC-1 (for KU), RMC-2 (for LG&E electric), and RMC-3 (for LG&E gas) to the testimony of Robert M. Conroy in this proceeding.

25. The proposed tariffs provide a 30-day notice through a proposed effective date of February 16, 2014; however, the Companies request that, after the Commission completes its investigation in this proceeding, the Commission enter a final order by November 17, 2014, approving the proposed programming, budgets, and metrics to be effective January 1, 2015.

26. The Companies project that the monthly bill impact of the new DSM/EE programs and program enhancements will be \$4.68 for LG&E residential electric customers and \$3.78 for KU residential electric customers using 1,000 kWh per month. The current DSM/EE charge for LG&E residential electric customers is \$4.39 and \$3.49 for KU residential electric customers. In other words, an LG&E or KU electric customer using 1,000 kWh per month will see a DSM/EE-related bill increase of \$0.29 per month.

27. The Companies project that the monthly gas bill impact of the new DSM/EE programs and program enhancements will be \$1.72 for LG&E residential gas customers using 70 ccf per month. The current DSM/EE charge for LG&E residential gas customers is \$1.50. In other words, an LG&E gas customer using 70 ccf per month will see a DSM/EE-related bill increase of \$0.22 per month.

Supporting Testimony and Request for Final Order

28. Michael E. Hornung, the Companies' Manager, Energy Efficiency Planning/Development, presents testimony that describes the results the Companies' Demand-Side Management and Energy Efficiency ("DSM/EE") programs have produced to date, as well as the need to continue, allow to expire, enhance, or propose new DSM/EE programs. He sponsors the Companies' 2015-2018 Demand-Side Management and Energy Efficiency Program

Plan (“Proposed DSM/EE Program Plan”) and describes each program therein, as well as the process the Companies used to formulate the review, including performing cost-benefit analyses, interacting with customer, government, and industry stakeholders, and ensuring consistency with the Companies’ most recent Integrated Resource Plan. Also, Mr. Hornung sponsors the *Louisville Electric and Gas/Kentucky Utility Company DSM Program Review* by The Cadmus Group, Inc. and the *Energy and Efficiency Potential Study*, also by Cadmus.

29. David E. Huff, the Companies’ Director of Customer Energy Efficiency and Smart Grid Strategy, presents testimony that describes the need for the Companies’ proposed Advanced Metering Systems. He sponsors the *LG&E and KU Smart Meter Business Case Assessment* by DNV KEMA Energy and Sustainability, the Responsive Pricing and Smart Metering Pilot Program Final Report for Louisville Gas and Electric Company, which LG&E filed in Case No. 2011-00440, and the *Residential Smart Meters Study* by Bellomy Research, Inc. Also, Mr. Huff co-sponsors the Companies’ Proposed DSM/EE Program Plan.

30. Robert M. Conroy, the Companies’ Director of Rates, presents testimony that discusses the Companies’ DSM Mechanism and revised tariff sheets. He sponsors the Companies’ revised tariff sheets and supporting calculations.

31. The Companies further respectfully request the Commission to complete its investigation and issue a final order in this proceeding by November 17, 2014, with the Companies’ revised tariff sheets to be effective on January 1, 2015.

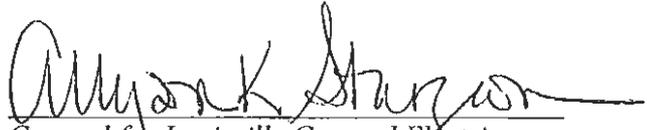
WHEREFORE, Louisville Gas and Electric Company and Kentucky Utilities Company respectfully request the Commission to issue an order approving the Companies’ Proposed DSM/EE Program Plan and the proposed revised Demand Side Management cost recovery tariffs

CERTIFICATE OF SERVICE

This is to certify that Louisville Gas and Electric Company and Kentucky Utilities Company's January 17, 2014 electronic filing is a true and accurate copy of the documents being filed in paper medium; that the electronic filing was transmitted to the Commission on January 17, 2014; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; that an original and one copy of the filing is being hand-delivered to the Commission on January 17, 2014; and that on January 17, 2014, electronic mail notification of the electronic filing will be provided to the following:

Dennis G. Howard II
Assistant Director
Office of the Attorney General
Office of Rate Intervention
1024 Capital Center Drive, Suite 200
Frankfort, KY 40601-8204

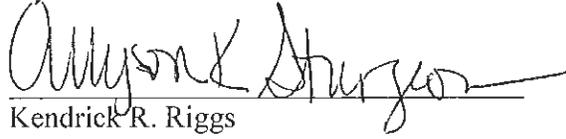
Michael L. Kurtz
Boehm, Kurtz & Lowry
36 East Seventh Street, Suite 1510
Cincinnati, OH 45202


*Counsel for Louisville Gas and Electric
Company and Kentucky Utilities Company*

by November 17, 2014, with the Companies' revised tariff sheets to be effective for service rendered on and after January 1, 2015.

Dated: January 17, 2014

Respectfully submitted,



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*Counsel for Louisville Gas and Electric Company
and Kentucky Utilities Company*

**Certificate of Existence from the Kentucky
Secretary of State for Louisville Gas and Electric
Company**

Exhibit 1

Commonwealth of Kentucky
Alison Lundergan Grimes, Secretary of State

Alison Lundergan Grimes
Secretary of State
P. O. Box 718
Frankfort, KY 40602-0718
(502) 564-3490
<http://www.sos.ky.gov>

Certificate of Existence

Authentication number: 146859
Visit <https://app.sos.ky.gov/ftshow/certvalidate.aspx> to authenticate this certificate.

I, Alison Lundergan Grimes, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records in the Office of the Secretary of State,

LOUISVILLE GAS AND ELECTRIC COMPANY

is a corporation duly incorporated and existing under KRS Chapter 14A and KRS Chapter 271B, whose date of incorporation is July 2, 1913 and whose period of duration is perpetual.

I further certify that all fees and penalties owed to the Secretary of State have been paid; that Articles of Dissolution have not been filed; and that the most recent annual report required by KRS 14A.6-010 has been delivered to the Secretary of State.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 9th day of January, 2014, in the 222nd year of the Commonwealth.



Alison Lundergan Grimes
Alison Lundergan Grimes
Secretary of State
Commonwealth of Kentucky
146859/0032196

**Certificate of Existence from the Kentucky
Secretary of State for Kentucky Utilities
Company and the Certificate of Good
Standing from the Virginia State
Corporation Commission**

Exhibit 2

Commonwealth of Kentucky
Alison Lundergan Grimes, Secretary of State

Alison Lundergan Grimes
Secretary of State
P. O. Box 718
Frankfort, KY 40602-0718
(502) 564-3490
<http://www.sos.ky.gov>

Certificate of Existence

Authentication number: 146846
Visit <https://app.sos.ky.gov/ftshow/certvalidate.aspx> to authenticate this certificate.

I, Alison Lundergan Grimes, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records in the Office of the Secretary of State,

KENTUCKY UTILITIES COMPANY

is a corporation duly incorporated and existing under KRS Chapter 14A and KRS Chapter 271B, whose date of incorporation is August 17, 1912 and whose period of duration is perpetual.

I further certify that all fees and penalties owed to the Secretary of State have been paid; that Articles of Dissolution have not been filed; and that the most recent annual report required by KRS 14A.6-010 has been delivered to the Secretary of State.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 8th day of January, 2014, in the 222nd year of the Commonwealth.



Alison Lundergan Grimes

Alison Lundergan Grimes
Secretary of State
Commonwealth of Kentucky
146846/0028494

Commonwealth OF Virginia



State Corporation Commission

CERTIFICATE OF GOOD STANDING

I Certify the Following from the Records of the Commission:

That KENTUCKY UTILITIES COMPANY is duly incorporated under the law of the Commonwealth of Virginia;

That the date of its incorporation is November 26, 1991;

That the period of its duration is perpetual; and

That the corporation is in existence and in good standing in the Commonwealth of Virginia as of the date set forth below.

Nothing more is hereby certified.



*Signed and Sealed at Richmond on this Date:
January 8, 2014*

Joel H. Peck

Joel H. Peck, Clerk of the Commission

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

**JOINT APPLICATION OF LOUISVILLE GAS)
AND ELECTRIC COMPANY AND KENTUCKY)
UTILITIES COMPANY FOR REVIEW,)
MODIFICATION, AND CONTINUATION OF)
EXISTING, AND ADDITION OF NEW,)
DEMAND-SIDE MANAGEMENT AND ENERGY)
EFFICIENCY PROGRAMS)**

CASE NO. 2014-00003

**DIRECT TESTIMONY OF
ROBERT M. CONROY
DIRECTOR, RATES
LG&E AND KU SERVICES COMPANY**

Filed: January 17, 2014

1 **Q. Please state your name, position, and business address.**

2 A. My name is Robert M. Conroy. I am the Director of Rates for LG&E and KU
3 Services Company, which provides services to Louisville Gas and Electric Company
4 (“LG&E”) and Kentucky Utilities (“KU”) (collectively, “Companies”). My business
5 address is 220 West Main Street, Louisville, Kentucky. A statement of my
6 qualifications and work experience is attached as Appendix A.

7 **Q. Have you previously testified before the Kentucky Public Service Commission?**

8 A. Yes. I have previously testified before this Commission in proceedings concerning
9 the Companies’ most recent rate cases, fuel adjustment clauses, and environmental
10 cost recovery surcharge mechanisms.

11 **Q. What are the purposes of your testimony?**

12 A. The purposes of my testimony are to summarize the filing and to discuss the Demand-
13 Side Management Cost Recovery Mechanism (“DSM Mechanism”).

14 **Q. Are you supporting any exhibits to your testimony?**

15 A. Yes, I am supporting clean and redlined versions of the revised DSM Mechanism
16 tariff sheets for each utility, as well as supporting calculations for each set of revised
17 tariff sheets, which are attached hereto as Exhibits RMC-1 (for KU), RMC-2 (for
18 LG&E electric), and RMC-3 (for LG&E gas).

19 **Overview**

20 **Q. Are other witnesses offering direct testimony on behalf of the Companies in this**
21 **case?**

22 A. Yes. Michael E. Hornung, the Companies’ Manager, Energy Efficiency
23 Planning/Development, presents testimony that describes the results the Companies’
24 Demand-Side Management and Energy Efficiency (“DSM/EE”) programs have

1 produced to date, as well as the need to continue, allow to expire, enhance, or propose
2 new DSM/EE programs. He sponsors the Companies' 2015-2018 Demand-Side
3 Management and Energy Efficiency Program Plan ("Proposed DSM/EE Program
4 Plan") and describes each program therein, as well as the process the Companies used
5 to formulate the review, including performing cost-benefit analyses, interacting with
6 customer, government, and industry stakeholders, and ensuring consistency with the
7 Companies' most recent Integrated Resource Plan. Also, Mr. Hornung sponsors the
8 *Louisville Electric and Gas/Kentucky Utility Company DSM Program Review* by The
9 Cadmus Group, Inc. and the *Energy and Efficiency Potential Study*, also by Cadmus.

10 David E. Huff, the Companies' Director of Customer Energy Efficiency and
11 Smart Grid Strategy, presents testimony that describes the need for the Companies'
12 proposed Advanced Metering Systems. He sponsors the *LG&E and KU Smart Meter*
13 *Business Case Assessment* by DNV KEMA Energy and Sustainability, the
14 Responsive Pricing and Smart Metering Pilot Program Final Report for Louisville
15 Gas and Electric Company, which LG&E filed in Case No. 2011-00440, and the
16 *Residential Smart Meters Study* by Bellomy Research, Inc. Also, Mr. Huff co-
17 sponsors the Companies' Proposed DSM/EE Program Plan.

18 **Proposed Effective Date**

19 **Q. Please explain why the Companies' Application asks the Commission to issue a**
20 **final order in this proceeding to permit the Companies' revised tariff sheets to**
21 **be effective for service rendered on and after January 1, 2015.**

22 A. The tariff sheets filed with this Application show a proposed effective date of
23 February 16, 2014, which is thirty days after the January 17, 2014 filing date. The

1 Companies expect the Commission, prior to the expiration of this 30-day notice, to
2 suspend the operation of the DSM Mechanism tariff sheets filed with this Application
3 for a period extending up to five months, and following the expiration of the five-
4 month suspension period, to issue a final order by November 17, 2014. However, in
5 their Application the Companies are requesting the approval of the enhanced suite of
6 DSM/EE programs and tariffs to be effective for service rendered on and after
7 January 1, 2015. The commencement of the new and enhanced DSM/EE programs
8 and recovery of their costs through the DSM Mechanism beginning January 1, 2015,
9 will allow the Companies to wind-up the current DSM/EE programs that will not be
10 continued and to prepare to implement the new and enhanced DSM/EE programs
11 requested in this Application.

12

13 **Proposed Changes to the DSM Mechanism Tariff Sheets**

14 **Q. What is the current DSM Mechanism formula?**

15 A. The current DSM Mechanism formula includes components for DSM cost recovery
16 (“DCR”) (excluding costs capitalized), DSM revenue from lost sales (“DRLS”), DSM
17 incentives (“DSMI”), DSM balancing adjustments (“DBA”), and DSM Capital Cost
18 Recovery (“DCCR”). The formula for calculating the DSM Cost Recovery
19 Component (“DSMRC”) is:

20
$$\text{DSMRC} = \text{DCR} + \text{DRLS} + \text{DSMI} + \text{DBA} + \text{DCCR}$$

21 **Q. Do the Companies propose any significant or fundamental changes to the DSM
22 Mechanism or the DSM tariff?**

23 A. No. The DSM Mechanism has operated successfully for many years, providing
24 customers a clear and certain line item on their bills for the Companies’ DSM/EE

1 programs. Also, the Companies' annual DSM/EE filings have provided the
2 Commission a high level of detail in a form that facilitates the Commission's
3 continuous review and oversight.

4 **Q. Do the Companies propose any changes to the terms of their DSM Capital Cost
5 Recovery component?**

6 A. No. The Companies propose to continue to use the DSM Capital Cost Recovery
7 component to recover and earn a return on the capital deployed through DSM/EE
8 programs, including continuing to use the return on equity the Commission approved
9 in Case No. 2011-00134. The Companies' Proposed DSM/EE Program Plan includes
10 two programs with capital components: the Residential and Commercial Load
11 Management/Demand Conservation Program and the Advanced Metering Systems.

12 **Q. What changes do the Companies propose to make to their DSM Mechanism
13 tariff sheets?**

14 A. The Companies propose minor changes to the language contained in the
15 Programmatic Customer Charges section of the Companies' tariff sheets. These
16 changes address the descriptions of the Companies' DSM/EE programs and the
17 incentives available to customers who participate. The Companies further propose
18 minor changes to the Energy Charges used to calculate the Monthly Adjustment
19 Factors in the DSM Cost Recovery Mechanism. These changes address program
20 enhancements and modifications identified in the Proposed DSM/EE Program Plan.
21 The revised tariff sheets (clean and redlined versions) and the supporting calculations
22 are attached hereto as Exhibits RMC-1 (for KU), RMC-2 (for LG&E electric), and
23 RMC-3 (for LG&E gas).

1 **Q. Do you have any recommendations for the Commission?**

2 A. Yes. The Commission should approve the Companies' Application in this
3 proceeding. As demonstrated in the testimony of Messrs. Hornung and Huff, the
4 Companies conducted comprehensive evaluation of the current and proposed
5 DSM/EE programming and consulted with numerous representatives of consumer
6 groups about the programs proposed in this Application. The strong consensus view
7 of those groups favors the proposed programs.

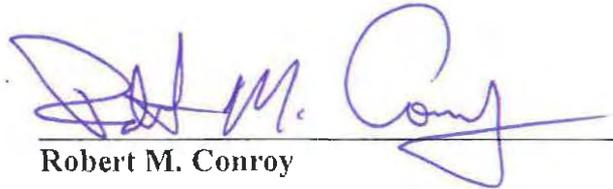
8 **Q. Does this conclude your testimony?**

9 A. Yes.

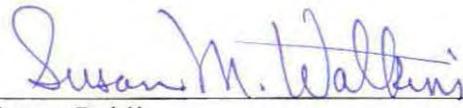
VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy**, being duly sworn, deposes and says that he is Director - Rates for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.


Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 17th day of January 2014.

 (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 10, 2017
Notary ID # 485723

APPENDIX A

Robert M. Conroy

Director, Rates

LG&E and KU Energy LLC

220 West Main Street

Louisville, Kentucky 40202

Telephone: (502) 627-3324

Previous Positions

Manager, Rates	April 2004 – Feb 2008
Manager, Generation Systems Planning	Feb. 2001 – April 2004
Group Leader, Generation Systems Planning	Feb. 2000 – Feb. 2001
Lead Planning Engineer	Oct. 1999 – Feb. 2000
Consulting System Planning Analyst	April 1996 – Oct. 1999
System Planning Analyst III & IV	Oct. 1992 - April 1996
System Planning Analyst II	Jan. 1991 - Oct. 1992
Electrical Engineer II	Jun. 1990 - Jan. 1991
Electrical Engineer I	Jun. 1987 - Jun. 1990

Professional/Trade Memberships

Registered Professional Engineer in Kentucky, 1995.

Education

Essentials of Leadership, London Business School, 2004

Masters of Business Administration;

Indiana University (Southeast campus), December 1998. GPA: 3.9.

Center for Creative Leadership, Foundations in Leadership program, 1998.

Bachelor of Science in Electrical Engineering;

Rose Hulman Institute of Technology, May 1987. GPA: 3.3

**Kentucky Utilities Company
Electric Tariffs
Clean Version**

Exhibit RMC-1

Kentucky Utilities Company

P.S.C. No. 16, Second Revision of Original Sheet No. 86.4
Canceling P.S.C. No. 16, First Revision of Original Sheet No. 86.4

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RS, VFD and LEV Standard Electric Rate Schedules.

Residential Load Management / Demand Conservation

The Residential Load Management / Demand Conservation Program employs switches in homes to help reduce the demand for electricity during peak times. The program communicates with the switches to cycle central air conditioning units, heat pumps, electric water heaters, and pool pumps off and on through a predetermined sequence. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

T

Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ranging from \$150 to \$1,000 based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

T

Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, and blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve month energy usage and results of an energy audit.

T

Smart Energy Profile

The Smart Energy Profile Program provides a portion of KU's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar local properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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State Regulation and Rates
Lexington, Kentucky

Kentucky Utilities Company

P.S.C. No. 16, Second Revision of Original Sheet No. 86.5
Canceling P.S.C. No. 16, First Revision of Original Sheet No. 86.5

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Residential Incentives Program

The Residential Incentives Program encourages customers to purchase and install various ENERGY STAR® appliances, HVAC equipment, or window films that meet certain requirements, qualifying them for an incentive as noted in the table below.

Category	Item	Incentive
Appliances	Heat Pump Water Heaters (HPWH)	\$300 per qualifying item purchased
	Washing Machine	\$75 per qualifying item purchased
	Refrigerator	\$100 per qualifying item purchased
	Freezer	\$50 per qualifying item purchased
	Dishwasher	\$50 per qualifying item purchased
Window Film	Window Film	Up to 50% of materials cost only; max of \$200 per customer account; product must meet applicable criteria.
HVAC	Central Air Conditioner	\$100 per Energy Star item purchased plus an additional \$100 per SEER improvement above minimum
	Electric Air-Source Heat Pump	\$100 per Energy Star item purchased plus additional \$100 per SEER improvement above minimum

Residential Refrigerator Removal Program

The Residential Refrigerator Removal Program is designed to provide removal and recycling of working, inefficient secondary refrigerators and freezers from KU customer households. Customers participating in this program will be provided a one-time incentive. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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State Regulation and Rates
Lexington, Kentucky

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Kentucky Utilities Company

P.S.C. No. 16, Second Revision of Original Sheet No. 86.6
Canceling P.S.C. No. 16, First Revision of Original Sheet No. 86.6

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Residential Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the RS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the GS, AES, PS, TODS, and TODP Standard Electric Rate Schedules.

Commercial Load Management / Demand Conservation

The Commercial Load Management / Demand Conservation Program employs switches or interfaces to customer equipment in small and large commercial businesses to help reduce the demand for electricity during peak times. The Program communicates with the switches or interface to cycle equipment. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.9.

Commercial Conservation / Commercial Incentives

The Commercial Conservation / Commercial Incentive Program is designed to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment and for new construction built beyond code requirements. The Program also offers an online tool providing recommendations for energy-efficiency improvements. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvement projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable kW removed. New construction rebates are available on savings over code plus bonus rebates for LEED certification.

- Maximum annual incentive per facility is \$50,000
- Customers can receive multi-year incentives in a single year where such multi-year incentives do not exceed the aggregate of \$100,000 per facility and no incentive was provided in the immediately preceding year
- Applicable for combined Prescriptive, Custom and New Construction Rebates

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Kentucky Utilities Company

P.S.C. No. 16, Second Revision of Original Sheet No. 86.7
Canceling P.S.C. No. 16, First Revision of Original Sheet No. 86.7

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

School Energy Management Program

The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325.

Commercial Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the GS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

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Lexington, Kentucky

Kentucky Utilities Company

P. S. C. No. 16, Fourth Revision of Original Sheet No. 86.8
Canceling P.S.C. No. 16, Third Revision of Original Sheet No. 86.8

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

D

Current Program Incentive Structures

Residential Load Management / Demand Conservation

Switch Option:

- \$5/month bill credit for June, July, August, and September per air conditioning unit or heat pump on single family home. T
- \$2/month bill credit for June, July, August, and September per electric water heater (40 gallon minimum) or swimming pool pump on single family home. T
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit or heat pump, water heater (40 gallon minimum) and/or swimming pool pump switch installed. T
 - Customers in a tenant-landlord relationship will receive the entire \$25 new customer incentive. T

Multi-family Option:

- Tenant - \$2/month bill credit per customer for June, July, August, and September per air conditioning unit, heat pump, or water heater (40 gallon minimum). T
- Entire Complex Enrollment – Property owner receives \$2/month incentive per air conditioning or heat pump switch to the premise owner for June, July, August, and September. T
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit or heat pump installed, where:
 - Customers in a tenant/property owner relationship where the entire complex participates, the property owner will receive a \$25 bonus incentive per air conditioning unit, heat pump, or water heater (40 gallon minimum).
 - Customers in a tenant-landlord relationship where only a portion of the complex participates, the tenant will receive a \$25 gift card new customer incentive. T

Residential Refrigerator Removal Program

The program provides \$50 per working refrigerator or freezer.

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State Regulation and Rates
Lexington, Kentucky

Kentucky Utilities Company

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Canceling P.S.C. No. 16, First Revision of Original Sheet No. 86.9

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Commercial Load Management / Demand Conservation

Switch Option

- \$5 per month bill credit for June, July, August, and September for air conditioning units up to 5 tons. An additional \$1 per month bill credit for each additional ton of air conditioning above 5 tons based upon unit rated capacity.

T

Customer Equipment Interface Option

The Company will offer a Load Management / Demand Response program tailored to a commercial customer's ability to reduce load. Program participants must commit to a minimum of 50 kW demand reduction per control event.

- \$25 per kW for verified load reduction during June, July, August, and September.
- The customer will have access to at least hourly load data for every month of the year which they remain enrolled in the program.
- Additional customer charges may be incurred for metering equipment necessary for this program at costs under other tariffs.

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Kentucky Utilities Company

P.S.C. No. 16, Fifth Revision of Original Sheet No. 86.10
Canceling P.S.C. No. 16, Fourth Revision of Original Sheet No. 86.10

Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors

Residential Service Rate RS, Volunteer Fire Department Service Rate VFD, and Low Emission Vehicle Service Rate LEV

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00167 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00117 per kWh	I
DSM Incentive (DSMI)	\$ 0.00008 per kWh	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00090 per kWh	I
DSM Balance Adjustment (DBA)	\$(0.00004) per kWh	
Total DSMRC for Rates RS, VFD and LEV	\$ 0.00378 per kWh	I

General Service Rate GS

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00068 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00149 per kWh	R
DSM Incentive (DSMI)	\$ 0.00003 per kWh	R
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00008 per kWh	I
DSM Balance Adjustment (DBA)	\$(0.00006) per kWh	
Total DSMRC for Rates GS	\$ 0.00222 per kWh	R

All Electric School Rate AES

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00024 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00049 per kWh	I
DSM Incentive (DSMI)	\$ 0.00001 per kWh	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00031 per kWh	I
DSM Balance Adjustment (DBA)	\$(0.00004) per kWh	
Total DSMRC for Rate AES	\$ 0.00101 per kWh	I

Commercial Customers Served Under Power Service Rate PS, Time of Day Secondary Service Rate TODS, and Time-of-Day Primary Service Rate TODP

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00024 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00050 per kWh	I
DSM Incentive (DSMI)	\$ 0.00001 per kWh	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00013 per kWh	I
DSM Balance Adjustment (DBA)	\$(0.00019) per kWh	
Total DSMRC for Rates PS, TODS, and TODP	\$ 0.00069 per kWh	I

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State Regulation and Rates
Lexington, Kentucky

**Kentucky Utilities Company
Electric Tariffs
Supporting Calculations for DSM Cost Recovery
Mechanism**

Exhibit RMC-1

KENTUCKY UTILITIES COMPANY

**Supporting Calculations for the
DSM Cost Recovery Mechanism**

ELECTRIC SERVICE

**Twelve-Month Period Beginning January 1, 2015
and Ending December 31, 2015**

Summary of Total DSM Recovery Component (DSMRC)
12-Month Period Beginning January 1, 2015

Rate Schedule		Cost Recovery Component (DCR)	Lost Sales Component (DRLS)	Incentive Component (DSMI)	Capital Cost Recovery Component (DCCR)	Balance Adj Component (DBA)	DSM Recovery Component (DSMRC)	
Residential Service, Volunteer Fire Department Service, & Low Emission Vehicle Service	RS, VFD, & LEV	0.167	0.117	0.008	0.090	(0.004)	0.378	¢/kWh
General Service	GS	0.068	0.149	0.003	0.008	(0.006)	0.222	¢/kWh
All Electric Schools	AES	0.024	0.049	0.001	0.031	(0.004)	0.101	¢/kWh
Power Service, Time-of-Day Service - Primary & Secondary	PS, TODP, & TODS	0.024	0.050	0.001	0.013	(0.019)	0.069	¢/kWh

**Summary of DSM Revenues from DSM Cost Recovery Component (DCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Cost Recovery Total Amount	Estimated Billing Determinants		DSM Cost Recovery Component (DCR)	
Residential Service, Volunteer Fire Department Service, & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 10,565,686	6,323,633,336 kWh		0.167	¢/kWh
General Service	GS	\$ 1,324,801	1,959,635,314 kWh		0.068	¢/kWh
All Electric Schools	AES	\$ 35,467	146,878,176 kWh		0.024	¢/kWh
Power Service, Time-of-Day Service - Primary & Secondary	PS, TODP, & TODS	\$ 780,415	3,309,226,896 kWh		0.024	¢/kWh
Total DCR Amount		\$ 12,706,369				

Program costs, which are categorized by residential and commercial must be allocated to the individual rate schedules. The first step, allocation between gas and electric, and between LGE and KU, is shown on "DSM Budget Allocation" page.

Next, the DSM Program costs are further assigned to the rate schedules, which is the second and final step of the cost allocation process and is shown on the "Calculation of DCR Component from Forecast Sales" page. The total amount to be collected for each rate class is divided by the forecasted sales for that rate class to calculate the component rate in terms of ¢ / kWh.

DSM Budget Allocation

Program	Allocation	2015
Total of All Programs		
LGE: RS et al	28.4%	7,213,256
LGE: RGS et al	14.0%	3,558,253
LGE: GS	4.2%	1,067,338
LGE: PS	2.3%	588,465
LGE: CTOD et al	0.7%	186,979
LGE: CGS et al	0.4%	92,079
KU: RS et al	41.6%	10,565,686
KU: GS	5.2%	1,324,801
KU: AES	0.1%	35,467
KU: PS et al	3.1%	780,415
Total	100.0%	25,412,739

Residential Audit		
LGE: RS et al	29.4%	662,078
LGE: RGS et al	20.6%	465,468
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,127,546
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,255,093

Residential WeCare		
LGE: RS et al	19.3%	954,634
LGE: RGS et al	30.7%	1,518,754
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,473,388
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,946,777

Residential Lighting		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Incentives		
LGE: RS et al	50.0%	2,054,137
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,054,137
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,108,275

Program	Allocation	2015
Development & Administration		
LGE: RS et al	24.7%	338,549
LGE: RGS et al	20.4%	280,569
LGE: GS	3.0%	41,432
LGE: PS	0.2%	2,497
LGE: CTOD et al	0.0%	147
LGE: CGS et al	1.7%	23,426
KU: RS et al	41.3%	567,252
KU: GS	8.0%	110,228
KU: AES	0.1%	850
KU: PS et al	0.6%	8,290
Total	100.0%	1,373,240

Residential Construction		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Responsive Smart Meters		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Dealer Referral Network		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Frig Removal		
LGE: RS et al	50.0%	1,018,363
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,018,363
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,036,726

Program	Allocation	2015
AMI / Smart Grid		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Audit		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	27.1%	904,846
LGE: PS	17.3%	577,632
LGE: CTOD et al	5.6%	186,979
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	26.7%	891,490
KU: AES	0.9%	30,050
KU: PS et al	22.4%	747,917
Total	100.0%	3,338,915

Commercial HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Education & Information		
LGE: RS et al	24.7%	996,770
LGE: RGS et al	20.4%	826,062
LGE: GS	3.0%	121,985
LGE: PS	0.2%	7,351
LGE: CTOD et al	0.0%	433
LGE: CGS et al	1.7%	68,971
KU: RS et al	41.3%	1,670,125
KU: GS	8.0%	324,537
KU: AES	0.1%	2,503
KU: PS et al	0.6%	24,407
Total	100.0%	4,043,146

Residential Smart Energy Profile		
LGE: RS et al	35.8%	1,183,779
LGE: RGS et al	14.2%	471,505
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,655,284
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	3,310,567

**Calculation of DCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	All Electric Schools AES	Power Service (excl. Industrial) PS et al
January 2015	694,810,717	175,932,702	15,307,604	270,302,269
February 2015	626,388,322	157,134,047	13,062,782	232,974,067
March 2015	570,143,621	151,519,373	12,631,777	240,647,191
April 2015	437,868,534	130,360,545	11,097,010	235,211,082
May 2015	368,812,149	138,446,353	10,800,020	273,608,143
June 2015	502,044,239	179,635,296	10,818,499	299,689,602
July 2015	601,086,505	192,549,728	10,242,090	323,354,424
August 2015	606,734,219	196,110,794	12,121,206	321,341,317
September 2015	481,194,637	166,215,214	12,639,396	282,002,826
October 2015	377,905,190	149,557,311	11,765,220	280,690,027
November 2015	444,567,133	151,310,030	12,018,292	267,176,479
December 2015	612,078,070	170,863,921	14,374,280	282,229,469
Total	6,323,633,336	1,959,635,314	146,878,176	3,309,226,896
Total Program Costs	\$ 10,565,686	\$ 1,324,801	\$ 35,467	\$ 780,415
DCR Factor in ¢ per kWh	0.167	0.068	0.024	0.024

**Summary of DSM Revenues from DSM Lost Sales Component (DRLS)
12-Month Period Beginning January 1, 2015**

Rate Schedule		Lost Net Revenues Total Amount	Estimated Billing Determinants		DSM Revenue from Lost Sales Component (DRLS)	
Residential Service, Volunteer Fire Department Service, & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 7,368,186	6,323,633,336 kWh		0.117	¢/kWh
General Service	GS	\$ 2,921,848	1,959,635,314 kWh		0.149	¢/kWh
All Electric Schools	AES	\$ 71,874	146,878,176 kWh		0.049	¢/kWh
Power Service, Time-of-Day Service - Primary & Secondary	PS, TODP, & TODS	\$ 1,669,940	3,309,226,896 kWh		0.050	¢/kWh
Total DRLS Amount		\$ 12,031,848				

**Calculation of DRLS Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	All Electric Schools AES	Power Service (excl. Industrial) PS et al
January 2015	694,810,717	175,932,702	15,307,604	270,302,269
February 2015	626,388,322	157,134,047	13,062,782	232,974,067
March 2015	570,143,621	151,519,373	12,631,777	240,647,191
April 2015	437,868,534	130,360,545	11,097,010	235,211,082
May 2015	368,812,149	138,446,353	10,800,020	273,608,143
June 2015	502,044,239	179,635,296	10,818,499	299,689,602
July 2015	601,086,505	192,549,728	10,242,090	323,354,424
August 2015	606,734,219	196,110,794	12,121,206	321,341,317
September 2015	481,194,637	166,215,214	12,639,396	282,002,826
October 2015	377,905,190	149,557,311	11,765,220	280,690,027
November 2015	444,567,133	151,310,030	12,018,292	267,176,479
December 2015	612,078,070	170,863,921	14,374,280	282,229,469
Total	6,323,633,336	1,959,635,314	146,878,176	3,309,226,896
Total Energy Savings	162,294,841	49,860,886	1,699,152	41,853,126
Non-variable Revenue per kWh	0.0454	0.0586	0.0423	0.0399
Lost Net Revenue	\$ 7,368,186	\$ 2,921,848	\$ 71,874	\$ 1,669,940
DRLS Factor in ¢ per kWh	0.117	0.149	0.049	0.050

Summary of DSM Revenues from DSM Incentive Component (DSMI)
12-Month Period Beginning January 1, 2015

Rate Schedule		DSM Incentive Total Amount	Estimated Billing Determinants		DSM Incentive Component (DSMI)	
Residential Service, Volunteer Fire Department Service, & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 499,927	6,323,633,336 kWh		0.008	¢/kWh
General Service	GS	\$ 60,747	1,959,635,314 kWh		0.003	¢/kWh
All Electric Schools*	AES	\$ 1,705	146,878,176 kWh		0.001	¢/kWh
Power Service, Time-of-Day Service - Primary & Secondary	PS, TODP, & TODS	\$ 38,609	3,309,226,896 kWh		0.001	¢/kWh
Total DSMI Amount		\$ 600,988				

Incentives for each individual program is calculated as 15% of Net Resource Benefits (as specified in the California Standardized Tests) capped at 5% of program costs. The incentive by programs is then allocated across the rate classes using the same method as the cost recovery component.

**Calculation of DSMI Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	All Electric Schools AES	Power Service (excl. Industrial) PS et al
January 2015	694,810,717	175,932,702	15,307,604	270,302,269
February 2015	626,388,322	157,134,047	13,062,782	232,974,067
March 2015	570,143,621	151,519,373	12,631,777	240,647,191
April 2015	437,868,534	130,360,545	11,097,010	235,211,082
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November 2015	444,567,133	151,310,030	12,018,292	267,176,479
December 2015	612,078,070	170,863,921	14,374,280	282,229,469
Total	6,323,633,336	1,959,635,314	146,878,176	3,309,226,896
Total Program Incentive	\$ 499,927	\$ 60,747	\$ 1,705	\$ 38,609
DSMI Factor in ¢ per kWh	0.008	0.003	0.001	0.001

**Summary of DSM Revenues from DSM Capital Cost Recovery (DCCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Capital Cost Recovery Total Amount	Estimated Billing Determinants		DSM Capital Cost Recovery Component (DCCR)	
Residential Service, Volunteer Fire Department Service, & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 5,693,092	6,323,633,336 kWh		0.090	¢/kWh
General Service	GS	\$ 161,608	1,959,635,314 kWh		0.008	¢/kWh
All Electric Schools	AES	\$ 45,296	146,878,176 kWh		0.031	¢/kWh
Power Service, Time-of-Day Service - Primary & Secondary	PS, TODP, & TODS	\$ 444,394	3,309,226,896 kWh		0.013	¢/kWh
Total DCCR Amount		\$ 6,344,391				

The DSM Capital Cost Recovery (DCCR), allows the Companies' to earn an approved rate of return on equity exclusively for the capital expenditures. The Companies' return on equity is equal to 10.50%.

**Calculation of Total E(m) and Jurisdictional Surcharge Billing Factor
12-Month Period Beginning January 1, 2015**

Calculation of Total E(m)

$E(m) = [(RB) (ROR+(ROR -DR)(TR/(1-TR)))] + OE$, where

RB	=	DSM Rate Base	=	\$	3,424,660
ROR	=	Rate of Return on the DSM Rate Base	=		7.26%
DR	=	Debt Rate (both short-term and long-term debt)	=		1.56%
TR	=	Composite Federal & State Income Tax Rate	=		38.90%
OE	=	Operating Expenses			

DSM Plans

RB		=	\$	3,424,660
(ROR + (ROR - DR) (TR / (1 - TR)))		=		10.89%
Return on Rate Base		=	\$	372,945
OE		=	\$	5,971,445
E(m)		=	\$	6,344,391

E(m) by Rate Class

Electric	Residential Service	RS et al	\$	5,693,092
	General Service	GS	\$	161,608
	All Electric Schools	AES	\$	45,296
	Power Service (excl. Industrial)	PS et al	\$	444,394
	Total		\$	6,344,391

**Calculation of Base Rate and Operating Expense
12-Month Period Beginning January 1, 2015**

Determination of DSM Rate Base

Eligible Plant / Capital Expenditures In Service	\$	4,467,983	
Eligible Accumulated Depreciation	\$	(683,732)	
CWIP Amount Excluding AFUDC	\$	0	
Eligible Net Plant / Capital Expenditures In Service			\$ 3,784,251
Deferred Tax Balance as of January 1, 2015			\$ (359,591)
Yearly Depreciation Expense			\$ 0
Yearly Property Tax Expense			\$ 0
			<hr/>
Total			\$ 3,424,660

Determination of DSM Operating Expenses

		O&M	Depreciation Expense	Property Tax Expense
Demand Load Conservation	Residential	\$ 4,932,345	\$ 243,046	\$ 29,389
	Commercial	\$ 472,752	\$ 61,867	\$ 6,539
	Total	<hr/> \$ 5,405,097	<hr/> \$ 304,913	<hr/> \$ 35,928
AMI / Smart Grid	Residential	\$ 185,743	\$ 3,684	\$ -
	Commercial	\$ 35,380	\$ 702	\$ -
	Total	<hr/> \$ 221,122	<hr/> \$ 4,385	<hr/> \$ -
				<hr/>
				Total Operating Expenses
	Residential			\$ 5,394,206
	Commercial			\$ 577,240
Total Operating Expenses	Total			<hr/> \$ 5,971,445

**Calculation of DCCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	All Electric Schools AES	Power Service (excl. Industrial) PS et al
January 2015	694,810,717	175,932,702	15,307,604	270,302,269
February 2015	626,388,322	157,134,047	13,062,782	232,974,067
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September 2015	481,194,637	166,215,214	12,639,396	282,002,826
October 2015	377,905,190	149,557,311	11,765,220	280,690,027
November 2015	444,567,133	151,310,030	12,018,292	267,176,479
December 2015	612,078,070	170,863,921	14,374,280	282,229,469
Total	6,323,633,336	1,959,635,314	146,878,176	3,309,226,896
Total DCCR Program Component	\$ 5,693,092	\$ 161,608	\$ 45,296	\$ 444,394
DCCR Factor in ¢ per kWh	0.090	0.008	0.031	0.013

Rate Base by Program
12-Month Period Beginning January 1, 2015

Rate Base by Program

Demand Load Conservation	Residential	\$	2,594,927
	Commercial	\$	<u>651,558</u>
	Total	\$	3,246,485
AMI / Smart Grid	Residential	\$	149,667
	Commercial	\$	<u>28,508</u>
	Total	\$	178,175

Allocation between Residential and Commercial	Residential	\$	2,744,594
	Commercial	\$	<u>680,066</u>
	Total	\$	3,424,660

**Kentucky Utilities Company
Electric Tariffs
Red-Line Version**

Exhibit RMC-1

Kentucky Utilities Company

P.S.C. No. 16, ~~Second Revision of Original Sheet No. 86.4~~
Canceling P.S.C. No. 16, ~~First Revision of Original Sheet No. 86.4~~

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Adjustment Clause DSM
Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RS, VFD and LEV Standard Electric Rate Schedules.

Residential Load Management / Demand Conservation

The Residential Load Management / Demand Conservation Program employs switches in homes to help reduce the demand for electricity during peak times. The program communicates with the switches to cycle central air conditioning units, heat pumps, electric water heaters, and pool pumps off and on through a predetermined sequence. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

T

Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ranging from \$150 to \$1,000 based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

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Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, and blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve month energy usage and results of an energy audit.

T

Smart Energy Profile

The Smart Energy Profile Program provides a portion of KU's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar local properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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DATE OF ISSUE: ~~January 17, 2014~~

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DATE EFFECTIVE: ~~February 16, 2014~~

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ISSUED BY: /s/ ~~Edwin R. Staton~~, Vice President
State Regulation and Rates
Lexington, Kentucky

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Kentucky Utilities Company

P.S.C. No. 16, **Second Revision of Original Sheet No. 86.5**
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Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Residential Incentives Program

The Residential Incentives Program encourages customers to purchase and install various ENERGY STAR® appliances, HVAC equipment, or window films that meet certain requirements, qualifying them for an incentive as noted in the table below.

Category	Item	Incentive
Appliances	Heat Pump Water Heaters (HPWH)	\$300 per qualifying item purchased
	Washing Machine	\$75 per qualifying item purchased
	Refrigerator	\$100 per qualifying item purchased
	Freezer	\$50 per qualifying item purchased
	Dishwasher	\$50 per qualifying item purchased
Window Film	Window Film	Up to 50% of materials cost only; max of \$200 per customer account; product must meet applicable criteria.
HVAC	Central Air Conditioner	\$100 per Energy Star item purchased plus an additional \$100 per SEER improvement above minimum
	Electric Air-Source Heat Pump	\$100 per Energy Star item purchased plus additional \$100 per SEER improvement above minimum

Residential Refrigerator Removal Program

The Residential Refrigerator Removal Program is designed to provide removal and recycling of working, inefficient secondary refrigerators and freezers from KU customer households. Customers participating in this program will be provided a one-time incentive. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

Deleted: Residential High Efficiency Lighting Program¶

The Residential High Efficiency Lighting program promotes an increased use of ENERGY STAR® rated CFLs within the residential sector. The Residential High Efficiency Lighting Program distributes compact fluorescent bulbs through direct-mail. ¶

¶ Residential New Construction Program¶

The Residential New Construction program is designed to reduce residential energy usage and facilitate market transformation by creating a shift in builders' new home construction to include energy-efficient construction practices. Builders who are part of the program can take advantage of technical training classes, gain additional exposure to potential customers and receive incentives to help offset costs when including more energy-efficient features during home construction. KU will reimburse the cost of plan reviews and inspection costs related to an Energy Star or HERS home certification.

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ISSUED BY: /s/ Edwin R. Staton, Vice President
 State Regulation and Rates
 Lexington, Kentucky

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Kentucky Utilities Company

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Canceling P.S.C. No. 16, **First Revision of Original Sheet No. 86.6**

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Residential Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the RS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the GS, AES, PS, TODS, and TODP Standard Electric Rate Schedules.

Commercial Load Management / Demand Conservation

The Commercial Load Management / Demand Conservation Program employs switches or interfaces to customer equipment in small and large commercial businesses to help reduce the demand for electricity during peak times. The Program communicates with the switches or interface to cycle equipment. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.9.

Commercial Conservation / Commercial Incentives

The Commercial Conservation / Commercial Incentive Program is designed to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment and for new construction built beyond code requirements. The Program also offers an online tool providing recommendations for energy-efficiency improvements. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvement projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable kW removed. New construction rebates are available on savings over code plus bonus rebates for LEED certification.

- Maximum annual incentive per facility is \$50,000
- Customers can receive multi-year incentives in a single year where such multi-year incentives do not exceed the aggregate of \$100,000 per facility and no incentive was provided in the immediately preceding year
- Applicable for combined Prescriptive, Custom, and New Construction Rebates

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DATE EFFECTIVE: February 16, 2014

ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Lexington, Kentucky

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These programs help customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through two processes: a mass-media campaign and an elementary- and middle-school program. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts.¶

Deleted: Residential HVAC Diagnostics and Tune Up Program¶

The Residential HVAC Diagnostic and Tune-up program targets customers with HVAC system performance issues. There are no incentives paid directly to customers. Customers are charged a discounted, fixed-fee for the diagnosis and if needed, a similar fee for implementation of corrective actions. Thus, the program pays the portion of diagnostic and tune-up cost in excess of the customer charge below. The customer cost is as follows:¶
<#>Customer cost is \$35 per unit for diagnostics test¶
<#>Customer cost is \$50 per unit for tune-up¶

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The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs.¶

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Kentucky Utilities Company

P.S.C. No. 16, **Second Revision of Original Sheet No. 86.7**
Canceling P.S.C. No. 16, **First Revision of Original Sheet No. 86.7**

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Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

School Energy Management Program

The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325.

Commercial Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the GS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

D Moved up [1]: Commercial Conservation (Energy Audits) / Commercial Incentives¶

T The Commercial Conservation / Commercial Incentive Program is designed to provide energy efficiency opportunities for the Companies' commercial class customers through energy audits and to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvements projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable KW removed.¶

T Deleted: Commercial HVAC Diagnostics and Tune Up Program¶

T The Commercial HVAC Diagnostic and Tune-up program targets customers with HVAC system performance issues. There are no incentives paid directly to customers. Customers are charged a discounted, fixed-fee for the diagnosis and if needed, a similar fee for implementation of corrective actions. Thus, the program pays the portion of diagnostic and tune-up cost in excess of the customer charge below. The customer cost is as follows:¶
<#>Customer cost is \$50 per unit for diagnostics test¶
<#>Customer cost is \$100 per unit for tune-up¶

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The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs

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ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Lexington, Kentucky

Kentucky Utilities Company

P. S. C. No. 16, **Fourth** Revision of Original Sheet No. 86.8
Canceling P.S.C. No. 16, **Third** Revision of Original Sheet No. 86.8

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Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Current Program Incentive Structures

Moved up [2]: School Energy Management Prof

The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325.¶

Residential Load Management / Demand Conservation

Switch Option:

- \$5/month bill credit for June, July, August, **and** September per air conditioning unit or heat pump on single family home.
- \$2/month bill credit for June, July, August, **and** September per electric water heater (40 gallon minimum) or swimming pool pump on single family home.
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit or heat pump, water heater (40 gallon minimum) and/or swimming pool pump switch installed.
 - Customers in a tenant-landlord relationship will receive the entire \$25 new customer incentive.

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Multi-family Option:

- Tenant - \$2/month bill credit per customer for June, July, August, **and** September per air conditioning unit, heat pump, or water heater (40 gallon minimum).
- Entire Complex Enrollment – Property owner receives \$2/month incentive per air conditioning or heat pump switch to the premise owner for June, July, August, **and** September.
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit or heat pump installed, where:
 - Customers in a tenant/property owner relationship where the entire complex participates, the property owner will receive a \$25 bonus incentive per air conditioning unit, heat pump, or water heater (40 gallon minimum).
 - Customers in a tenant-landlord relationship where only a portion of the complex participates, the tenant will receive a \$25 gift card new customer incentive.

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Residential Refrigerator Removal Program

The program provides \$50 per working refrigerator or freezer.

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State Regulation and Rates
Lexington, Kentucky

Kentucky Utilities Company

P.S.C. No. 16, **Second Revision of Original Sheet No. 86.9**
Canceling P.S.C. No. 16, **First Revision of Original Sheet No. 86.9**

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Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Commercial Load Management / Demand Conservation

Switch Option

- \$5 per month bill credit for June, July, August, **and** September for air conditioning units up to 5 tons. An additional \$1 per month bill credit for each additional ton of air conditioning above 5 tons based upon unit rated capacity.

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Customer Equipment Interface Option

The Company will offer a Load Management / Demand Response program tailored to a commercial customer's ability to reduce load. Program participants must commit to a minimum of 50 **kW** demand reduction per control event.

- \$25 per **kW** for verified load reduction during June, July, August, **and** September.
- The customer will have access to at least hourly load data for every month of the year which they remain enrolled in the program.
- Additional customer charges may be incurred for metering equipment necessary for this program at costs under other tariffs.

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State Regulation and Rates
Lexington, Kentucky

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Kentucky Utilities Company

P.S.C. No. 16, ~~Fifth~~ Revision of Original Sheet No. 86.10
Canceling P.S.C. No. 16, ~~Fourth~~ Revision of Original Sheet No. 86.10

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Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors

Residential Service Rate RS, Volunteer Fire Department Service Rate VFD, and Low Emission Vehicle Service Rate LEV

DSM Cost Recovery Component (DCR)
DSM Revenues from Lost Sales (DRLS)
DSM Incentive (DSMI)
DSM Capital Cost Recovery Component (DCCR)
DSM Balance Adjustment (DBA)
Total DSMRC for Rates RS, VFD and LEV

Energy Charge

\$ ~~0.00167~~, per kWh R Deleted: 0.00178
\$ ~~0.00117~~, per kWh I Deleted: 0.00098
\$ 0.00008 per kWh
\$ ~~0.00090~~, per kWh I Deleted: 0.00069
\$ ~~(0.00004)~~ per kWh
\$ ~~0.00378~~, per kWh I Deleted: 0.00349

General Service Rate GS

DSM Cost Recovery Component (DCR)
DSM Revenues from Lost Sales (DRLS)
DSM Incentive (DSMI)
DSM Capital Cost Recovery Component (DCCR)
DSM Balance Adjustment (DBA)
Total DSMRC for Rates GS

Energy Charge

\$ ~~0.00068~~, per kWh R Deleted: 0.00086
\$ ~~0.00149~~, per kWh R Deleted: 0.00151
\$ ~~0.00003~~, per kWh R Deleted: 0.00004
\$ ~~0.00008~~, per kWh I Deleted: 0.00003
\$ ~~(0.00006)~~ per kWh
\$ ~~0.00222~~, per kWh R Deleted: 0.00238

All Electric School Rate AES

DSM Cost Recovery Component (DCR)
DSM Revenues from Lost Sales (DRLS)
DSM Incentive (DSMI)
DSM Capital Cost Recovery Component (DCCR)
DSM Balance Adjustment (DBA)
Total DSMRC for Rate AES

Energy Charge

\$ ~~0.00024~~, per kWh R Deleted: 0.00029
\$ ~~0.00049~~, per kWh I Deleted: 0.00048
\$ 0.00001 per kWh
\$ ~~0.00031~~, per kWh I Deleted: 0.00014
\$ ~~(0.00004)~~ per kWh
\$ ~~0.00101~~, per kWh I Deleted: 0.00088

Commercial Customers Served Under Power Service Rate PS, Time of Day Secondary Service Rate TODS, and Time-of-Day Primary Service Rate TODP

DSM Cost Recovery Component (DCR)
DSM Revenues from Lost Sales (DRLS)
DSM Incentive (DSMI)
DSM Capital Cost Recovery Component (DCCR)
DSM Balance Adjustment (DBA)
Total DSMRC for Rates PS, TODS, and TODP

Energy Charge

\$ ~~0.00024~~, per kWh R Deleted: 0.00030
\$ ~~0.00050~~, per kWh I Deleted: 0.00049
\$ 0.00001 per kWh
\$ ~~0.00013~~, per kWh I Deleted: 0.00006
\$ ~~(0.00019)~~ per kWh
\$ ~~0.00069~~, per kWh I Deleted: 0.00067

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State Regulation and Rates
Lexington, Kentucky

**Louisville Gas and Electric Company
Electric Tariffs
Clean Version**

Exhibit RMC-2

Louisville Gas and Electric Company

P.S.C. Electric No. 9, Second Revision of Original Sheet No. 86.4
Canceling P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.4

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RS, VFD and LEV Standard Electric Rate Schedules.

Residential Load Management / Demand Conservation

The Residential Load Management / Demand Conservation Program employs switches in homes to help reduce the demand for electricity during peak times. The program communicates with the switches to cycle central air conditioning units, heat pumps, electric water heaters, and pool pumps off and on through a predetermined sequence. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

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Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ranging from \$150 to \$1,000 based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

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Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, and blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve-month energy usage and results of an energy audit.

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Smart Energy Profile

The Smart Energy Profile Program provides a portion of LG&E's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar local properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.5
Canceling P.S.C. Electric No. 9, Original Sheet No. 86.5

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Residential Incentives Program

The Residential Incentives Program encourages customers to purchase and install various ENERGY STAR® appliances, HVAC equipment, or window films that meet certain requirements, qualifying them for an incentive as noted in the table below.

Category	Item	Incentive
Appliances	Heat Pump Water Heaters (HPWH)	\$300 per qualifying item purchased
	Washing Machine	\$75 per qualifying item purchased
	Refrigerator	\$100 per qualifying item purchased
	Freezer	\$50 per qualifying item purchased
	Dishwasher	\$50 per qualifying item purchased
Window Film	Window Film	Up to 50% of materials cost only; max of \$200 per customer account; product must meet applicable criteria.
HVAC	Central Air Conditioner	\$100 per Energy Star item purchased plus an additional \$100 per SEER improvement above minimum
	Electric Air-Source Heat Pump	\$100 per Energy Star item purchased plus additional \$100 per SEER improvement above minimum

Residential Refrigerator Removal Program

The Residential Refrigerator Removal Program is designed to provide removal and recycling of working, inefficient secondary refrigerators and freezers from LG&E customer households. Customers participating in this program will be provided a one-time incentive. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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Louisville, Kentucky

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Louisville Gas and Electric Company

P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.6
Canceling P.S.C. Electric No. 9, Original Sheet No. 86.6

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Residential Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the RS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the GS, PS, TODS, CTODP, and RTS Standard Electric Rate Schedules.

Commercial Load Management / Demand Conservation

The Commercial Load Management / Demand Conservation Program employs switches or interfaces to customer equipment in small and large commercial businesses to help reduce the demand for electricity during peak times. The Program communicates with the switches or interface to cycle equipment. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.9.

Commercial Conservation / Commercial Incentives

The Commercial Conservation / Commercial Incentive Program is designed to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment and for new construction built beyond code requirements. The Program also offers an online tool providing recommendations for energy-efficiency improvements. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvement projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable kW removed. New construction rebates are available on savings over code plus bonus rebates for LEED certification.

- Maximum annual incentive per facility is \$50,000
- Customers can receive multi-year incentives in a single year where such multi-year incentives do not exceed the aggregate of \$100,000 per facility and no incentive was provided in the immediately preceding year
- Applicable for combined Prescriptive, Custom, and New Construction Rebates

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State Regulation and Rates
Louisville, Kentucky

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Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

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Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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School Energy Management Program

The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325

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Commercial Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the GS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

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State Regulation and Rates
Louisville, Kentucky

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Current Program Incentive Structures

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Residential Load Management / Demand Conservation

Switch Option:

- \$5/month bill credit for June, July, August, and September per air conditioning unit or heat pump on single family home. T
- \$2/month bill credit for June, July, August, and September per electric water heater (40 gallon minimum) or swimming pool pump on single family home. T
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit, heat pump, water heater (40 gallon minimum) and/or swimming pool pump switch installed. T
 - Customers in a tenant-landlord relationship will receive the entire \$25 new customer incentive. T

Multi-family Option:

- Tenant - \$2/month bill credit per customer for June, July, August, and September per air conditioning unit, heat pump, or water heater (40 gallon minimum). T
- Entire Complex Enrollment – Property owner receives \$2/month incentive per air conditioning or heat pump switch to the premise owner for June, July, August, and September. T
- If new customer registers by May 31, 2014, then a \$25 gift card per air-conditioning unit or heat pump installed, where: T
 - Customers in a tenant/property owner relationship where the entire complex participates, the property owner will receive a \$25 bonus incentive per air conditioning unit, heat pump, or water heater (40 gallon minimum).
 - Customers in a tenant-landlord relationship where only a portion of the complex participates, the tenant will receive a \$25 gift card new customer incentive.

Residential Refrigerator Removal Program

The program provides \$50 per working refrigerator or freezer.

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State Regulation and Rates
Louisville, Kentucky

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Commercial Load Management / Demand Conservation

Switch Option

- \$5 per month bill credit for June, July, August, and September for air conditioning units up to 5 tons. An additional \$1 per month bill credit for each additional ton of air conditioning above 5 tons based upon unit rated capacity.

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Customer Equipment Interface Option

The Company will offer a Load Management / Demand Response program tailored to a commercial customer's ability to reduce load. Program participants must commit to a minimum of 50 kW demand reduction per control event.

- \$25 per kW for verified load reduction during June, July, August, and September.
- The customer will have access to at least hourly load data for every month of the year which they remain enrolled in the program.
- Additional customer charges may be incurred for metering equipment necessary for this program at costs under other tariffs.

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State Regulation and Rates
Louisville, Kentucky

P.S.C. Electric No. 9, Fourth Revision of Original Sheet No. 86.10
Canceling P.S.C. Electric No. 9, Third Revision of Original Sheet No. 86.10

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors

Residential Rate RS, Volunteer
 Fire Department Rate VFD, and
Low Emission Vehicle Service Rate LEV

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00170 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00164 per kWh	I
DSM Incentive (DSMI)	\$ 0.00008 per kWh	R
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00138 per kWh	I
DSM Balance Adjustment (DBA)	\$ <u>(0.00012)</u> per kWh	
Total DSMRC for Rates RS, VFD, and LEV	\$ 0.00468 per kWh	I

General Service Rate GS

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00075 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00200 per kWh	I
DSM Incentive (DSMI)	\$ 0.00004 per kWh	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00011 per kWh	I
DSM Balance Adjustment (DBA)	\$ <u>(0.00004)</u> per kWh	
Total DSMRC for Rate GS	\$ 0.00286 per kWh	R

Commercial Customers Served Under Power Service Rate PS

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00029 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00067 per kWh	I
DSM Incentive (DSMI)	\$ 0.00001 per kWh	R
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00024 per kWh	I
DSM Balance Adjustment (DBA)	\$ <u>0.00002</u> per kWh	
Total DSMRC for Rate PS	\$ 0.00123 per kWh	I

Commercial Customers Served Under Time-of-Day
 Secondary Service Rate TODS and Commercial
Time-of-Day Primary Service Rate CTODP

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00022 per kWh	R
DSM Revenues from Lost Sales (DRLS)	\$ 0.00046 per kWh	
DSM Incentive (DSMI)	\$ 0.00001 per kWh	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00003 per kWh	I
DSM Balance Adjustment (DBA)	\$ <u>(0.00002)</u> per kWh	
Total DSMRC for Rates TODS, and CTODP	\$ 0.00070 per kWh	R

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 State Regulation and Rates
 Louisville, Kentucky

**Louisville Gas and Electric Company
Electric Tariffs
Supporting Calculations for DSM Cost Recovery
Mechanism**

Exhibit RMC-2

LOUISVILLE GAS & ELECTRIC COMPANY

**Supporting Calculations for the
DSM Cost Recovery Mechanism**

ELECTRIC SERVICE

**Twelve-Month Period Beginning January 1, 2015
and Ending December 31, 2015**

Summary of Total DSM Recovery Component (DSMRC)
12-Month Period Beginning January 1, 2015

Rate Schedule		Cost Recovery Component (DCR)	Lost Sales Component (DRLS)	Incentive Component (DSMI)	Capital Cost Recovery Component (DCCR)	Balance Adj Component (DBA)	DSM Recovery Component (DSMRC)	
Residential Service, Volunteer Fire Dept., & Low Emission Vehicle Service	RS, VFD, & LEV	0.170	0.164	0.008	0.138	(0.012)	0.468	¢/kWh
General Service	GS	0.075	0.200	0.004	0.011	(0.004)	0.286	¢/kWh
Commercial Service under Power Service	PS	0.029	0.067	0.001	0.024	0.002	0.123	¢/kWh
Commercial Time-of-Day - Primary & Secondary	CTODP & CTODS	0.022	0.046	0.001	0.003	(0.002)	0.070	¢/kWh

**Summary of DSM Revenues from DSM Cost Recovery Component (DCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Cost Recovery Total Amount	Estimated Billing Determinants		DSM Cost Recovery Component (DCR)	
Residential Service, Volunteer Fire Dept., & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 7,213,256	4,247,089,487 kWh		0.170	¢/kWh
General Service	GS	\$ 1,067,338	1,424,587,692 kWh		0.075	¢/kWh
Commercial Service under Power Service	PS	\$ 588,465	2,032,406,244 kWh		0.029	¢/kWh
Commercial Time-of-Day - Primary & Secondary	CTODP & CTODS	\$ 186,979	839,616,941 kWh		0.022	¢/kWh
Total DCR Amount		\$ 9,056,038				

Program costs, which are categorized by residential and commercial must be allocated to the individual rate schedules. The first step, allocation between gas and electric, and between LGE and KU, is shown on "DSM Budget Allocation" page.

Next, the DSM Program costs are further assigned to the rate schedules, which is the second and final step of the cost allocation process and is shown on the "Calculation of DCR Component from Forecast Sales" page. The total amount to be collected for each rate class is divided by the forecasted sales for that rate class to calculate the component rate in terms of ¢ / kWh.

DSM Budget Allocation

Program	Allocation	2015
Total of All Programs		
LGE: RS et al	28.4%	7,213,256
LGE: RGS et al	14.0%	3,558,253
LGE: GS	4.2%	1,067,338
LGE: PS	2.3%	588,465
LGE: CTOD et al	0.7%	186,979
LGE: CGS et al	0.4%	92,079
KU: RS et al	41.6%	10,565,686
KU: GS	5.2%	1,324,801
KU: AES	0.1%	35,467
KU: PS et al	3.1%	780,415
Total	100.0%	25,412,739

Residential Audit		
LGE: RS et al	29.4%	662,078
LGE: RGS et al	20.6%	465,468
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,127,546
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,255,093

Residential WeCare		
LGE: RS et al	19.3%	954,634
LGE: RGS et al	30.7%	1,518,754
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,473,388
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,946,777

Residential Lighting		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Incentives		
LGE: RS et al	50.0%	2,054,137
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,054,137
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,108,275

Program	Allocation	2015
Development & Administration		
LGE: RS et al	24.7%	338,549
LGE: RGS et al	20.4%	280,569
LGE: GS	3.0%	41,432
LGE: PS	0.2%	2,497
LGE: CTOD et al	0.0%	147
LGE: CGS et al	1.7%	23,426
KU: RS et al	41.3%	567,252
KU: GS	8.0%	110,228
KU: AES	0.1%	850
KU: PS et al	0.6%	8,290
Total	100.0%	1,373,240

Residential Construction		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Responsive Smart Meters		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Dealer Referral Network		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Frig Removal		
LGE: RS et al	50.0%	1,018,363
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,018,363
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,036,726

Program	Allocation	2015
AMI / Smart Grid		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Audit		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	27.1%	904,846
LGE: PS	17.3%	577,632
LGE: CTOD et al	5.6%	186,979
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	26.7%	891,490
KU: AES	0.9%	30,050
KU: PS et al	22.4%	747,917
Total	100.0%	3,338,915

Commercial HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Education & Information		
LGE: RS et al	24.7%	996,770
LGE: RGS et al	20.4%	826,062
LGE: GS	3.0%	121,985
LGE: PS	0.2%	7,351
LGE: CTOD et al	0.0%	433
LGE: CGS et al	1.7%	68,971
KU: RS et al	41.3%	1,670,125
KU: GS	8.0%	324,537
KU: AES	0.1%	2,503
KU: PS et al	0.6%	24,407
Total	100.0%	4,043,146

Residential Smart Energy Profile		
LGE: RS et al	35.8%	1,183,779
LGE: RGS et al	14.2%	471,505
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,655,284
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	3,310,567

Louisville Gas and Electric - Electric Service
DCR Summary

**Calculation of DCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	Power Service PS	Commercial Time of Day CTOD et al
January 2015	360,449,429	118,651,822	161,357,553	66,391,411
February 2015	325,450,957	103,866,417	149,006,472	59,678,036
March 2015	306,653,362	110,073,990	155,217,568	63,864,753
April 2015	258,767,156	103,343,219	150,445,864	62,729,862
May 2015	278,275,539	116,677,933	177,771,327	73,262,971
June 2015	409,682,611	127,770,479	195,935,736	79,827,240
July 2015	514,543,120	149,835,628	206,642,181	85,030,503
August 2015	501,645,360	150,086,150	205,146,662	84,488,320
September 2015	399,324,215	118,748,694	169,425,756	70,998,530
October 2015	282,092,692	107,597,021	157,619,160	65,961,315
November 2015	265,543,078	106,723,333	149,672,932	62,750,660
December 2015	344,661,968	111,213,006	154,165,033	64,633,340
Total	4,247,089,487	1,424,587,692	2,032,406,244	839,616,941
Total Program Costs	\$ 7,213,256	\$ 1,067,338	\$ 588,465	\$ 186,979
DCR Factor in ¢ per kWh	0.170	0.075	0.029	0.022

**Summary of DSM Revenues from DSM Lost Sales Component (DRLS)
12-Month Period Beginning January 1, 2015**

Rate Schedule		Lost Net Revenues Total Amount	Estimated Billing Determinants		DSM Revenue from Lost Sales Component (DRLS)	
Residential Service, Volunteer Fire Dept., & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 6,969,001	4,247,089,487 kWh		0.164	¢/kWh
General Service	GS	\$ 2,850,104	1,424,587,692 kWh		0.200	¢/kWh
Commercial Service under Power Service	PS	\$ 1,361,952	2,032,406,244 kWh		0.067	¢/kWh
Commercial Time-of-Day - Primary & Secondary	CTODP & CTODS	\$ 386,553	839,616,941 kWh		0.046	¢/kWh
Total DRLS Amount		\$ 11,567,609				

**Calculation of DRLS Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	Power Service PS	Commercial Time of Day CTOD et al
January 2015	360,449,429	118,651,822	161,357,553	66,391,411
February 2015	325,450,957	103,866,417	149,006,472	59,678,036
March 2015	306,653,362	110,073,990	155,217,568	63,864,753
April 2015	258,767,156	103,343,219	150,445,864	62,729,862
May 2015	278,275,539	116,677,933	177,771,327	73,262,971
June 2015	409,682,611	127,770,479	195,935,736	79,827,240
July 2015	514,543,120	149,835,628	206,642,181	85,030,503
August 2015	501,645,360	150,086,150	205,146,662	84,488,320
September 2015	399,324,215	118,748,694	169,425,756	70,998,530
October 2015	282,092,692	107,597,021	157,619,160	65,961,315
November 2015	265,543,078	106,723,333	149,672,932	62,750,660
December 2015	344,661,968	111,213,006	154,165,033	64,633,340
Total	4,247,089,487	1,424,587,692	2,032,406,244	839,616,941
Total Energy Savings	133,505,762	45,674,749	29,039,484	9,337,017
Non-variable Revenue per kWh	0.0522	0.0624	0.0469	0.0414
Lost Net Revenue	\$ 6,969,001	\$ 2,850,104	\$ 1,361,952	\$ 386,553
DRLS Factor in ¢ per kWh	0.164	0.200	0.067	0.046

Summary of DSM Revenues from DSM Incentive Component (DSMI)
12-Month Period Beginning January 1, 2015

Rate Schedule		DSM Incentive Total Amount	Estimated Billing Determinants		DSM Incentive Component (DSMI)	
Residential Service, Volunteer Fire Dept., & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 343,703	4,247,089,487 kWh		0.008	¢/kWh
General Service	GS	\$ 51,307	1,424,587,692 kWh		0.004	¢/kWh
Commercial Service under Power Service	PS	\$ 29,286	2,032,406,244 kWh		0.001	¢/kWh
Commercial Time-of-Day - Primary & Secondary	CTODP & CTODS	\$ 9,349	839,616,941 kWh		0.001	¢/kWh
Total DSMI Amount		\$ 433,645				

Incentives for each individual program is calculated as 15% of Net Resource Benefits (as specified in the California Standardized Tests) capped at 5% of program costs. The incentive by programs is then allocated across the rate classes using the same method as the cost recovery component.

**Calculation of DSMI Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	Power Service PS	Commercial Time of Day CTOD et al
January 2015	360,449,429	118,651,822	161,357,553	66,391,411
February 2015	325,450,957	103,866,417	149,006,472	59,678,036
March 2015	306,653,362	110,073,990	155,217,568	63,864,753
April 2015	258,767,156	103,343,219	150,445,864	62,729,862
May 2015	278,275,539	116,677,933	177,771,327	73,262,971
June 2015	409,682,611	127,770,479	195,935,736	79,827,240
July 2015	514,543,120	149,835,628	206,642,181	85,030,503
August 2015	501,645,360	150,086,150	205,146,662	84,488,320
September 2015	399,324,215	118,748,694	169,425,756	70,998,530
October 2015	282,092,692	107,597,021	157,619,160	65,961,315
November 2015	265,543,078	106,723,333	149,672,932	62,750,660
December 2015	344,661,968	111,213,006	154,165,033	64,633,340
Total	4,247,089,487	1,424,587,692	2,032,406,244	839,616,941
Total Program Incentive	\$ 343,703	\$ 51,307	\$ 29,286	\$ 9,349
DSMI Factor in ¢ per kWh	0.008	0.004	0.001	0.001

**Summary of DSM Revenues from DSM Capital Cost Recovery (DCCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Capital Cost Recovery Total Amount	Estimated Billing Determinants	DSM Capital Cost Recovery Component (DCCR)
Residential Service, Volunteer Fire Dept., & Low Emission Vehicle Service	RS, VFD, & LEV	\$ 5,847,006	4,247,089,487 kWh	0.138 ¢/kWh
General Service	GS	\$ 159,233	1,424,587,692 kWh	0.011 ¢/kWh
Commercial Service under Power Service	PS	\$ 494,099	2,032,406,244 kWh	0.024 ¢/kWh
Commercial Time-of-Day - Primary & Secondary	CTODP & CTODS	\$ 23,780	839,616,941 kWh	0.003 ¢/kWh
Total DCCR Amount		\$ 6,524,118		

The DSM Capital Cost Recovery (DCCR), allows the Companies' to earn an approved rate of return on equity exclusively for the capital expenditures. The Companies' return on equity is equal to 10.50%.

**Calculation of Total E(m) and Jurisdictional Surcharge Billing Factor
12-Month Period Beginning January 1, 2015**

Calculation of Total E(m)

$E(m) = [(RB) (ROR+(ROR -DR)(TR/(1-TR)))] + OE$, where

RB	=	DSM Rate Base	=	\$	3,115,932
ROR	=	Rate of Return on the DSM Rate Base	=		7.40%
DR	=	Debt Rate (both short-term and long-term debt)	=		1.46%
TR	=	Composite Federal & State Income Tax Rate	=		38.90%
OE	=	Operating Expenses			

DSM Plans

RB	=	\$	3,115,932
$(ROR + (ROR - DR) (TR / (1 - TR)))$	=		11.18%
Return on Rate Base	=	\$	348,361
OE	=	\$	6,175,756
E(m)	=	\$	6,524,118

E(m) by Rate Class

Electric	Residential Service	RS et al	\$	5,847,006
	General Service	GS	\$	159,233
	Power Service	PS	\$	494,099
	Commercial T-of-D	CTOD et al	\$	23,780
	Total		\$	6,524,118

**Calculation of Base Rate and Operating Expense
12-Month Period Beginning January 1, 2015**

Determination of DSM Rate Base

Eligible Plant / Capital Expenditures In Service	\$	4,412,254	
Eligible Accumulated Depreciation	\$	(1,122,202)	
CWIP Amount Excluding AFUDC	\$	0	
Eligible Net Plant / Capital Expenditures In Service			\$ 3,290,051
Deferred Tax Balance as of January 1, 2015			\$ (174,120)
Yearly Depreciation Expense			\$ 0
Yearly Property Tax Expense			\$ 0
			<hr/>
Total	\$		3,115,932

Determination of DSM Operating Expenses

		O&M	Depreciation Expense	Property Tax Expense
Demand Load Conservation	Residential	\$ 4,932,345	\$ 402,366	\$ 30,645
	Commercial	\$ 472,752	\$ 104,125	\$ 6,810
	Total	<hr/> \$ 5,405,097	<hr/> \$ 506,490	<hr/> \$ 37,455
AMI / Smart Grid	Residential	\$ 196,799	\$ 4,977	\$ -
	Commercial	\$ 24,323	\$ 615	\$ -
	Total	<hr/> \$ 221,122	<hr/> \$ 5,592	<hr/> \$ -
				<hr/>
				Total Operating Expenses
	Residential			\$ 5,567,131
	Commercial			\$ 608,625
Total Operating Expenses	Total			<hr/> \$ 6,175,756

**Calculation of DCCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales kWh	Residential Service RS et al	General Service GS	Power Service PS	Commercial Time of Day CTOD et al
January 2015	360,449,429	118,651,822	161,357,553	66,391,411
February 2015	325,450,957	103,866,417	149,006,472	59,678,036
March 2015	306,653,362	110,073,990	155,217,568	63,864,753
April 2015	258,767,156	103,343,219	150,445,864	62,729,862
May 2015	278,275,539	116,677,933	177,771,327	73,262,971
June 2015	409,682,611	127,770,479	195,935,736	79,827,240
July 2015	514,543,120	149,835,628	206,642,181	85,030,503
August 2015	501,645,360	150,086,150	205,146,662	84,488,320
September 2015	399,324,215	118,748,694	169,425,756	70,998,530
October 2015	282,092,692	107,597,021	157,619,160	65,961,315
November 2015	265,543,078	106,723,333	149,672,932	62,750,660
December 2015	344,661,968	111,213,006	154,165,033	64,633,340
Total	4,247,089,487	1,424,587,692	2,032,406,244	839,616,941
Total DCCR Program Component	\$ 5,847,006	\$ 159,233	\$ 494,099	\$ 23,780
DCCR Factor in ¢ per kWh	0.138	0.011	0.024	0.003

Rate Base by Program
12-Month Period Beginning January 1, 2015

Rate Base by Program

Demand Load Conservation	Residential	\$	2,345,434
	Commercial	\$	<u>593,059</u>
	Total	\$	2,938,493

AMI / Smart Grid	Residential	\$	157,920
	Commercial	\$	<u>19,518</u>
	Total	\$	177,438

Allocation between Residential and Commercial	Residential	\$	2,503,354
	Commercial	\$	<u>612,577</u>
	Total	\$	3,115,932

**Louisville Gas and Electric Company
Electric Tariffs
Red-line Version**

Exhibit RMC-2

Louisville Gas and Electric Company

P.S.C. Electric No. 9, **Second Revision of Original Sheet No. 86.4**
Canceling P.S.C. Electric No. 9, **First Revision of Original Sheet No. 86.4**

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Adjustment Clause DSM
Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RS, VFD and LEV Standard Electric Rate Schedules.

Residential Load Management / Demand Conservation

The Residential Load Management / Demand Conservation Program employs switches in homes to help reduce the demand for electricity during peak times. The program communicates with the switches to cycle central air conditioning units, heat pumps, electric water heaters, and pool pumps off and on through a predetermined sequence. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

T

Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ranging from \$150 to \$1,000 based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

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Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, and blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve-month energy usage and results of an energy audit.

T

Smart Energy Profile

The Smart Energy Profile Program provides a portion of LG&E's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar local properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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DATE OF ISSUE: **January 17, 2014**

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DATE EFFECTIVE: **February 16, 2014**

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ISSUED BY: /s/ **Edwin R. Staton**, Vice President
State Regulation and Rates
Louisville, Kentucky

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Louisville Gas and Electric Company

P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.5
Canceled P.S.C. Electric No. 9, Original Sheet No. 86.5

Adjustment Clause DSM
Demand-Side Management Cost Recovery Mechanism

Residential Incentives Program

The Residential Incentives Program encourages customers to purchase and install various ENERGY STAR® appliances, HVAC equipment, or window films that meet certain requirements, qualifying them for an incentive as noted in the table below.

Category	Item	Incentive
Appliances	Heat Pump Water Heaters (HPWH)	\$300 per qualifying item purchased
	Washing Machine	\$75 per qualifying item purchased
	Refrigerator	\$100 per qualifying item purchased
	Freezer	\$50 per qualifying item purchased
	Dishwasher	\$50 per qualifying item purchased
Window Film	Window Film	Up to 50% of materials cost only; max of \$200 per customer account; product must meet applicable criteria.
HVAC	Central Air Conditioner	\$100 per Energy Star item purchased plus an additional \$100 per SEER improvement above minimum
	Electric Air-Source Heat Pump	\$100 per Energy Star item purchased plus additional \$100 per SEER improvement above minimum

Residential Refrigerator Removal Program

The Residential Refrigerator Removal Program is designed to provide removal and recycling of working, inefficient secondary refrigerators and freezers from LG&E customer households. Customers participating in this program will be provided a one-time incentive. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.8.

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

DATE OF ISSUE: January 17, 2014

DATE EFFECTIVE: February 16, 2014

ISSUED BY: /s/ Edwin R. Staton, Vice President
 State Regulation and Rates
 Louisville, Kentucky

Deleted: ¶ Residential High Efficiency Lighting Program¶

The Residential High Efficiency Lighting program promotes an increased use of ENERGY STAR® rated CFLs within the residential sector. The Residential High Efficiency Lighting Program distributes compact fluorescent bulbs through direct-mail. ¶

¶ Residential New Construction Program¶

The Residential New Construction program is designed to reduce residential energy usage and facilitate market transformation by creating a shift in builders' new home construction to include energy-efficient construction practices. Builders who are part of the program can take advantage of technical training classes, gain additional exposure to potential customers and receive incentives to help offset costs when including more energy-efficient features during home construction. LG&E will reimburse the cost of plan reviews and inspection costs related to an Energy Star or HERS home certification.

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Louisville Gas and Electric Company

P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.6
Canceled P.S.C. Electric No. 9, Original Sheet No. 86.6

Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Residential Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the RS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the GS, PS, TODS, CTODP, and RTS Standard Electric Rate Schedules.

Commercial Load Management / Demand Conservation

The Commercial Load Management / Demand Conservation Program employs switches or interfaces to customer equipment in small and large commercial businesses to help reduce the demand for electricity during peak times. The Program communicates with the switches or interface to cycle equipment. This program has an approved flexible incentive structure. The current program offering is defined on Sheet No 86.9.

Commercial Conservation / Commercial Incentives

The Commercial Conservation / Commercial Incentive Program is designed to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment and for new construction built beyond code requirements. The Program also offers an online tool providing recommendations for energy-efficiency improvements. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvement projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable kW removed. New construction rebates are available on savings over code plus bonus rebates for LEED certification.

- Maximum annual incentive per facility is \$50,000
- Customers can receive multi-year incentives in a single year where such multi-year incentives do not exceed the aggregate of \$100,000 per facility and no incentive was provided in the immediately preceding year
- Applicable for combined Prescriptive, Custom, and New Construction Rebates

DATE OF ISSUE: January 17, 2014

DATE EFFECTIVE: February 16, 2014

ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Louisville, Kentucky

Moved up [1]: Customer Education and Public Information¶

These programs help customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through two processes: a mass-media campaign and an elementary- and middle-school program. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts.¶

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Residential HVAC Diagnostics and Tune Up Program¶

The Residential HVAC Diagnostic and Tune-up program targets customers with HVAC system performance issues. There are no incentives paid directly to customers. Customers are charged a discounted, fixed-fee for the diagnosis and if needed, a similar fee for implementation of corrective actions. Thus, the program pays the portion of diagnostic and tune-up cost in excess of the customer charge below. The customer cost is as follows:¶
<#>Customer cost is \$35 per unit for diagnostics test¶
<#>Customer cost is \$50 per unit for tune-up¶

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The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs.¶

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Issued by Authority of an Order of the ¶
Public Service Commission in Case No. ¶
2012-00222 dated December 20, 2012

Louisville Gas and Electric Company

P.S.C. Electric No. 9, First Revision of Original Sheet No. 86.7
Canceling P.S.C. Electric No. 9, Original Sheet No. 86.7

Adjustment Clause DSM Demand-Side Management Cost Recovery Mechanism

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

School Energy Management Program

The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325

Commercial Advanced Metering Systems Incentives:

The following Demand Side Management offering is available to residential customers receiving service from the Company on the GS Rate Schedule.

Advanced Metering Systems

The Advanced Metering Systems offering is designed to provide energy consumption data to customers on a more frequent basis than is traditionally available through monthly billing. The Program employs advanced meters to communicate hourly consumption data to customers through a website.

Moved up [2]: Commercial Conservation (Energy Audits) / Commercial Incentives¶
The Commercial Conservation / Commercial Incentive Program is designed to provide energy efficiency opportunities for the Companies' commercial class customers through energy audits and to increase the implementation of energy efficiency measures by providing financial incentives to assist with the replacement of aging and less efficient equipment. Incentives available to all commercial customers are based upon a \$100 per kW removed for calculated efficiency improvements. A prescriptive list provides customers with incentive values for various efficiency improvements projects. Additionally, a custom rebate is available based upon company engineering validation of sustainable kW removed.¶

Deleted: Commercial HVAC Diagnostics and Tune Up Program¶
The Commercial HVAC Diagnostic and Tune-up program targets customers with HVAC system performance issues. There are no incentives paid directly to customers. Customers are charged a discounted, fixed-fee for the diagnosis and if needed, a similar fee for implementation of corrective actions. Thus, the program pays the portion of diagnostic and tune-up cost in excess of the customer charge below. The customer cost is as follows:¶
<#->Customer cost is \$50 per unit for diagnostics test¶
<#->Customer cost is \$100 per unit for tune-up¶

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Deleted: Dealer Referral Network¶
The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs.¶

Moved (insertion) [3]

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**Deleted: Issued by Authority of an Order of the ¶
Public Service Commission in Case No. ¶
2012-00222 dated December 20, 2012**

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DATE EFFECTIVE: February 16, 2014

ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Electric No. 9, **Fourth** Revision of Original Sheet No. 86.8
Canceling P.S.C. Electric No. 9, **Third** Revision of Original Sheet No. 86.8

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Adjustment Clause DSM
Demand-Side Management Cost Recovery Mechanism

Current Program Incentive Structures

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Moved up [3]: School Energy Management Program¶
The School Energy Management program will facilitate the hiring and retention of qualified, trained energy specialists by public school districts to support facilitation of energy efficiency measures for public and independent schools under KRS 160.325

Residential Load Management / Demand Conservation

Switch Option:

- \$5/month bill credit for June, July, August, **and** September per air conditioning unit or heat pump on single family home.
- \$2/month bill credit for June, July, August, **and** September per electric water heater (40 gallon minimum) or swimming pool pump on single family home.
- If new customer registers by May 31, 2014, then a \$25 gift card per air conditioning unit, heat pump, water heater (40 gallon minimum) and/or swimming pool pump switch installed.
 - Customers in a tenant-landlord relationship will receive the entire \$25 new customer incentive.

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Multi-family Option:

- Tenant - \$2/month bill credit per customer for June, July, August, **and** September per air conditioning unit, heat pump, or water heater (40 gallon minimum).
- Entire Complex Enrollment – Property owner receives \$2/month incentive per air conditioning or heat pump switch to the premise owner for June, July, August, **and** September.
- If new customer registers by May 31, 2014, then a \$25 gift card per air conditioning unit or heat pump installed, where:
 - Customers in a tenant/property owner relationship where the entire complex participates, the property owner will receive a \$25 bonus incentive per air conditioning unit, heat pump, or water heater (40 gallon minimum).
 - Customers in a tenant-landlord relationship where only a portion of the complex participates, the tenant will receive a \$25 gift card new customer incentive.

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Residential Refrigerator Removal Program

The program provides \$50 per working refrigerator or freezer.

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Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Electric No. 9, ~~Fourth~~ **Third** Revision of Original Sheet No. 86.10
 Canceling P.S.C. Electric No. 9, ~~Third~~ **Fourth** Revision of Original Sheet No. 86.10

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Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors

Residential Rate RS, Volunteer
 Fire Department Rate VFD, and
Low Emission Vehicle Service Rate LEV

DSM Cost Recovery Component (DCR)
 DSM Revenues from Lost Sales (DRLS)
 DSM Incentive (DSMI)
 DSM Capital Cost Recovery Component (DCCR)
 DSM Balance Adjustment (DBA)
 Total DSMRC for Rates RS, VFD, and LEV

Energy Charge

\$ ~~0.00170~~, per kWh Deleted: 0.00192
 \$ ~~0.00164~~, per kWh Deleted: 0.00144
 \$ ~~0.00008~~, per kWh Deleted: 0.00009
 \$ ~~0.00138~~, per kWh Deleted: 0.00106
 \$ ~~(0.00012)~~, per kWh Deleted: 0.00439
 \$ ~~0.00468~~, per kWh

General Service Rate GS

DSM Cost Recovery Component (DCR)
 DSM Revenues from Lost Sales (DRLS)
 DSM Incentive (DSMI)
 DSM Capital Cost Recovery Component (DCCR)
 DSM Balance Adjustment (DBA)
 Total DSMRC for Rate GS

Energy Charge

\$ ~~0.00075~~, per kWh Deleted: 0.00089
 \$ ~~0.00200~~, per kWh Deleted: 0.00199
 \$ 0.00004 per kWh
 \$ ~~0.00011~~, per kWh Deleted: 0.00004
 \$ ~~(0.00004)~~, per kWh
 \$ ~~0.00286~~, per kWh Deleted: 0.00292

Commercial Customers Served Under Power Service Rate PS

DSM Cost Recovery Component (DCR)
 DSM Revenues from Lost Sales (DRLS)
 DSM Incentive (DSMI)
 DSM Capital Cost Recovery Component (DCCR)
 DSM Balance Adjustment (DBA)
 Total DSMRC for Rate PS

Energy Charge

\$ ~~0.00029~~, per kWh Deleted: 0.00033
 \$ ~~0.00067~~, per kWh Deleted: 0.00066
 \$ ~~0.00001~~, per kWh Deleted: 0.00002
 \$ ~~0.00024~~, per kWh Deleted: 0.00011
 \$ ~~0.00002~~, per kWh Deleted: 0.00114
 \$ ~~0.00123~~, per kWh

Commercial Customers Served Under Time-of-Day
 Secondary Service Rate TODS and Commercial
Time-of-Day Primary Service Rate CTODP

DSM Cost Recovery Component (DCR)
 DSM Revenues from Lost Sales (DRLS)
 DSM Incentive (DSMI)
 DSM Capital Cost Recovery Component (DCCR)
 DSM Balance Adjustment (DBA)
 Total DSMRC for Rates TODS, and CTODP

Energy Charge

\$ ~~0.00022~~, per kWh Deleted: 0.00025
 \$ 0.00046 per kWh
 \$ 0.00001 per kWh
 \$ ~~0.00003~~, per kWh Deleted: 0.00002
 \$ ~~(0.00002)~~, per kWh
 \$ ~~0.00070~~, per kWh Deleted: 0.00072

DATE OF ISSUE: ~~January 17, 2014~~

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DATE EFFECTIVE: ~~February 16, 2014~~

Deleted: December 31, 2013

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 State Regulation and Rates
 Louisville, Kentucky

**Louisville Gas and Electric Company
Gas Tariffs
Clean Version**

Exhibit RMC-3

Louisville Gas and Electric Company

P.S.C. Gas No. 9, Second Revision of Original Sheet No. 86.4
Canceling P.S.C. Gas No. 9, First Revision of Original Sheet No. 86.4

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RGS and VFD Standard Gas Rate Schedules.

Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ranging from \$150 to \$1,000 based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

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Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, and blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve month energy usage and results of an energy audit.

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Smart Energy Profile

The Smart Energy Profile Program provides a portion of LG&E's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar local properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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State Regulation and Rates
Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Gas No. 9, Second Revision of Original Sheet No. 86.5
Canceling P.S.C. Gas No. 9, First Revision of Original Sheet No. 86.5

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

D

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign and an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the CGS, IGS, AAGS, FT, TS, and TS-2 Standard Gas Rate Schedules and Riders.

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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State Regulation and Rates
Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Gas No. 9, Third Revision of Original Sheet No. 86.6
Canceling P.S.C. Gas No. 9, Second Revision of Original Sheet No. 86.6

Adjustment Clause

DSM

Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors:

Residential Rate RGS and Volunteer Fire Department Rate VFD

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.01798 per Ccf	
DSM Revenues from Lost Sales (DRLS)	\$ 0.00473 per Ccf	
DSM Incentive (DSMI)	\$ 0.00083 per Ccf	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00000 per Ccf	
DSM Balance Adjustment (DBA)	\$ <u>0.00104</u> per Ccf	
Total DSMRC for Rates RGS and VFD	\$ 0.02458 per Ccf	

Commercial Customers Served Under Firm Commercial Gas Service Rate CGS, As-Available Gas Service Rate AAGS, Firm Transportation Rate FT, Gas Transportation Service/Standby Rider TS, and Gas Transportation Service/Firm Balancing Service Rider TS-2

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00089 per Ccf	
DSM Revenues from Lost Sales (DRLS)	\$ 0.00000 per Ccf	
DSM Incentive (DSMI)	\$ 0.00000 per Ccf	
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00000 per Ccf	
DSM Balance Adjustment (DBA)	\$ <u>0.00009</u> per Ccf	
Total DSMRC for Rates CGS, AAGS, FT, TS, and TS-2	\$ 0.00098 per Ccf	

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State Regulation and Rates
Louisville, Kentucky

**Louisville Gas and Electric Company
Gas Tariffs
Supporting Calculations for DSM Cost Recovery
Mechanism**

Exhibit RMC-3

LOUISVILLE GAS & ELECTRIC COMPANY

**Supporting Calculations for the
DSM Cost Recovery Mechanism**

GAS SERVICE

**Twelve-Month Period Beginning January 1, 2015
and Ending December 31, 2015**

**Summary of Total DSM Recovery Component (DSMRC)
 12-Month Period Beginning January 1, 2015**

Rate Schedule		Cost Recovery Component (DCR)	Lost Sales Component (DRLS)	Incentive Component (DSMI)	Capital Cost Recovery Component (DCCR)	Balance Adj Component (DBA)	DSM Recovery Component (DSMRC)	
Residential Gas Service & Volunteer Fire Dept.	RGS & VFD	1.798	0.473	0.083	0.000	0.104	2.458	¢/Ccf
Commercial Gas Service, As Available Gas Service, Gas Transportation Service/Standby, & Firm Transportation	CGS, AAGS, TS, & FT	0.089	0.000	0.000	0.000	0.009	0.098	¢/Ccf

Louisville Gas and Electric - Gas Service
DCR Summary

**Summary of DSM Revenues from DSM Cost Recovery Component (DCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Cost Recovery Total Amount	Estimated Billing Determinants		DSM Cost Recovery Component (DCR)	
Residential Gas Service & Volunteer Fire Dept.	RGS & VFD	\$ 3,558,253	197,851,872	Ccf	1.798	¢/Ccf
Commercial Gas Service, As Available Gas Service, Gas Transportation Service/Standby, & Firm Transportation	CGS, AAGS, TS, & FT	\$ 92,079	103,300,925	Ccf	0.089	¢/Ccf
Total DCR Amount		\$ 3,650,332				

Program costs, which are categorized by residential and commercial must be allocated to the individual rate schedules. The first step, allocation between gas and electric, and between LGE and KU, is shown on "DSM Budget Allocation" page.

Next, the DSM Program costs are further assigned to the rate schedules, which is the second and final step of the cost allocation process and is shown on the "Calculation of DCR Component from Forecast Sales" page. The total amount to be collected for each rate class is divided by the forecasted sales for that rate class to calculate the component rate in terms of ¢ / CCF.

DSM Budget Allocation

Program	Allocation	2015
Total of All Programs		
LGE: RS et al	28.4%	7,213,256
LGE: RGS et al	14.0%	3,558,253
LGE: GS	4.2%	1,067,338
LGE: PS	2.3%	588,465
LGE: CTOD et al	0.7%	186,979
LGE: CGS et al	0.4%	92,079
KU: RS et al	41.6%	10,565,686
KU: GS	5.2%	1,324,801
KU: AES	0.1%	35,467
KU: PS et al	3.1%	780,415
Total	100.0%	25,412,739

Residential Audit		
LGE: RS et al	29.4%	662,078
LGE: RGS et al	20.6%	465,468
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,127,546
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,255,093

Residential WeCare		
LGE: RS et al	19.3%	954,634
LGE: RGS et al	30.7%	1,518,754
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,473,388
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,946,777

Residential Lighting		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Incentives		
LGE: RS et al	50.0%	2,054,137
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	2,054,137
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	4,108,275

Program	Allocation	2015
Development & Administration		
LGE: RS et al	24.7%	338,549
LGE: RGS et al	20.4%	280,569
LGE: GS	3.0%	41,432
LGE: PS	0.2%	2,497
LGE: CTOD et al	0.0%	147
LGE: CGS et al	1.7%	23,426
KU: RS et al	41.3%	567,252
KU: GS	8.0%	110,228
KU: AES	0.1%	850
KU: PS et al	0.6%	8,290
Total	100.0%	1,373,240

Residential Construction		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Responsive Smart Meters		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Dealer Referral Network		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Residential Frig Removal		
LGE: RS et al	50.0%	1,018,363
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,018,363
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	2,036,726

Program	Allocation	2015
AMI / Smart Grid		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Audit		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	27.1%	904,846
LGE: PS	17.3%	577,632
LGE: CTOD et al	5.6%	186,979
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	26.7%	891,490
KU: AES	0.9%	30,050
KU: PS et al	22.4%	747,917
Total	100.0%	3,338,915

Commercial HVAC		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Commercial Demand		
LGE: RS et al	0.0%	0
LGE: RGS et al	0.0%	0
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	0.0%	0
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	0.0%	0

Education & Information		
LGE: RS et al	24.7%	996,770
LGE: RGS et al	20.4%	826,062
LGE: GS	3.0%	121,985
LGE: PS	0.2%	7,351
LGE: CTOD et al	0.0%	433
LGE: CGS et al	1.7%	68,971
KU: RS et al	41.3%	1,670,125
KU: GS	8.0%	324,537
KU: AES	0.1%	2,503
KU: PS et al	0.6%	24,407
Total	100.0%	4,043,146

Residential Smart Energy Profile		
LGE: RS et al	35.8%	1,183,779
LGE: RGS et al	14.2%	471,505
LGE: GS	0.0%	0
LGE: PS	0.0%	0
LGE: CTOD et al	0.0%	0
LGE: CGS et al	0.0%	0
KU: RS et al	50.0%	1,655,284
KU: GS	0.0%	0
KU: AES	0.0%	0
KU: PS et al	0.0%	0
Total	100.0%	3,310,567

**Calculation of DCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales Ccf	Residential Gas Service RGS et al	Commercial Gas Service CGS et al
January 2015	38,868,753	18,973,742
February 2015	37,572,880	18,594,103
March 2015	29,784,730	14,239,980
April 2015	17,537,252	9,281,404
May 2015	8,014,368	4,662,757
June 2015	4,016,242	3,519,914
July 2015	3,409,633	2,959,098
August 2015	3,509,545	2,867,563
September 2015	4,190,036	2,995,211
October 2015	6,797,168	3,991,055
November 2015	15,463,271	7,420,188
December 2015	28,687,994	13,795,910
Total	197,851,872	103,300,925
Total Program Costs	\$ 3,558,253	\$ 92,079
DCR Factor in ¢ per Ccf	1.798	0.089

Louisville Gas and Electric - Gas Service
DRLS Summary

**Summary of DSM Revenues from DSM Lost Sales Component (DRLS)
12-Month Period Beginning January 1, 2015**

Rate Schedule		Lost Net Revenues Total Amount	Estimated Billing Determinants		DSM Revenue from Lost Sales Component (DRLS)	
Residential Gas Service & Volunteer Fire Dept.	RGS & VFD	\$ 935,777	197,851,872	Ccf	0.473	¢/Ccf
Commercial Gas Service, As Available Gas Service, Gas Transportation Service/Standby, & Firm Transportation	CGS, AAGS, TS, & FT	\$ -	103,300,925	Ccf	0.000	¢/Ccf
Total DRLS Amount		\$ 935,777				

**Calculation of DRLS Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales Ccf	Residential Gas Service RGS et al	Commercial Gas Service CGS et al
January 2015	38,868,753	18,973,742
February 2015	37,572,880	18,594,103
March 2015	29,784,730	14,239,980
April 2015	17,537,252	9,281,404
May 2015	8,014,368	4,662,757
June 2015	4,016,242	3,519,914
July 2015	3,409,633	2,959,098
August 2015	3,509,545	2,867,563
September 2015	4,190,036	2,995,211
October 2015	6,797,168	3,991,055
November 2015	15,463,271	7,420,188
December 2015	28,687,994	13,795,910
Total	197,851,872	103,300,925
Total Gas Savings	3,541,928	-
Non-variable Revenue per Ccf	0.2642	0.2100
Lost Net Revenue	\$ 935,777	\$ -
DRLS Factor in ¢ per Ccf	0.473	0.000

Summary of DSM Revenues from DSM Incentive Component (DSMI)
12-Month Period Beginning January 1, 2015

Rate Schedule		DSM Incentive Total Amount	Estimated Billing Determinants		DSM Incentive Component (DSMI)	
Residential Gas Service & Volunteer Fire Dept.	RGS & VFD	\$ 163,906	197,851,872	Ccf	0.083	¢/Ccf
Commercial Gas Service, As Available Gas Service, Gas Transportation Service/Standby, & Firm Transportation	CGS, AAGS, TS, & FT	\$ -	103,300,925	Ccf	0.000	¢/Ccf
Total DSMI Amount		\$ 163,906				

Incentives for each individual program is calculated as 15% of Net Resource Benefits (as specified in the California Standardized Tests) capped at 5% of program costs. The incentive by programs is then allocated across the rate classes using the same method as the cost recovery component.

**Calculation of DSMI Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales Ccf	Residential Gas Service RGS et al	Commercial Gas Service CGS et al
January 2015	38,868,753	18,973,742
February 2015	37,572,880	18,594,103
March 2015	29,784,730	14,239,980
April 2015	17,537,252	9,281,404
May 2015	8,014,368	4,662,757
June 2015	4,016,242	3,519,914
July 2015	3,409,633	2,959,098
August 2015	3,509,545	2,867,563
September 2015	4,190,036	2,995,211
October 2015	6,797,168	3,991,055
November 2015	15,463,271	7,420,188
December 2015	28,687,994	13,795,910
Total	197,851,872	103,300,925
Total Program Incentive	\$ 163,906	\$ -
DSMI Factor in ¢ per Ccf	0.083	0.000

**Summary of DSM Revenues from DSM Capital Cost Recovery (DCCR)
12-Month Period Beginning January 1, 2015**

Rate Schedule		DSM Capital Cost Recovery Total Amount	Estimated Billing Determinants	DSM Capital Cost Recovery Component (DCCR)
Residential Gas Service & Volunteer Fire Dept.	RGS & VFD	\$ -	197,851,872 Ccf	0.000 ¢/Ccf
Commercial Gas Service, As Available Gas Service, Gas Transportation Service/Standby, & Firm Transportation	CGS, AAGS, TS, & FT	\$ -	103,300,925 Ccf	0.000 ¢/Ccf
Total DCCR Amount		\$ -		

The DSM Capital Cost Recovery (DCCR), allows the Companies' to earn an approved rate of return on equity exclusively for the capital expenditures. The Companies' return on equity is equal to 10.50%.

**Calculation of Total E(m) and Jurisdictional Surcharge Billing Factor
12-Month Period Beginning January 1, 2015**

Calculation of Total E(m)

$E(m) = [(RB) (ROR+(ROR - DR)(TR/(1-TR)))] + OE$, where

RB	=	DSM Rate Base	=	\$	0
ROR	=	Rate of Return on the DSM Rate Base	=	7.40%	
DR	=	Debt Rate (both short-term and long-term debt)	=	1.46%	
TR	=	Composite Federal & State Income Tax Rate	=	38.90%	
OE	=	Operating Expenses			

DSM Plans

RB		=	\$	0
(ROR + (ROR - DR) (TR / (1 - TR)))		=	11.18%	
Return on Rate Base		=	\$	0
OE		=	\$	0
E(m)		=	\$	-

E(m) by Rate Class

Gas	Residential Service	RGS et al	\$	-
	Commercial Gas Service	CGS et al	\$	-
	Total		\$	-

**Calculation of Base Rate and Operating Expense
12-Month Period Beginning January 1, 2015**

Determination of DSM Rate Base

Eligible Plant / Capital Expenditures In Service	\$	0	
Eligible Accumulated Depreciation	\$	0	
CWIP Amount Excluding AFUDC	\$	0	
Eligible Net Plant / Capital Expenditures In Service		\$	0
Deferred Tax Balance as of January 1, 2015		\$	0
Yearly Depreciation Expense		\$	0
Yearly Property Tax Expense		\$	0

Total		\$	0

Determination of DSM Operating Expenses

		O&M	Depreciation Expense	Property Tax Expense
Demand Load Conservation	Residential	\$ -	\$ -	\$ -
	Commercial	\$ -	\$ -	\$ -
	Total	\$ -	\$ -	\$ -
AMI / Smart Grid	Residential	\$ -	\$ -	\$ -
	Commercial	\$ -	\$ -	\$ -
	Total	\$ -	\$ -	\$ -
			Total Operating Expenses	
	Residential		\$	-
	Commercial		\$	-
Total Operating Expenses	Total		-----	\$ -

**Calculation of DCCR Component from Forecast Sales
12-Month Period Beginning January 1, 2015**

Forecast Sales Ccf	Residential Gas Service RGS et al	Commercial Gas Service CGS et al
January 2015	38,868,753	18,973,742
February 2015	37,572,880	18,594,103
March 2015	29,784,730	14,239,980
April 2015	17,537,252	9,281,404
May 2015	8,014,368	4,662,757
June 2015	4,016,242	3,519,914
July 2015	3,409,633	2,959,098
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September 2015	4,190,036	2,995,211
October 2015	6,797,168	3,991,055
November 2015	15,463,271	7,420,188
December 2015	28,687,994	13,795,910
Total	197,851,872	103,300,925
Total DCCR Program Component	\$ -	\$ -
DCCR Factor in ¢ per Ccf	0.000	0.000

Rate Base by Program
12-Month Period Beginning January 1, 2015

Rate Base by Program

Demand Load Conservation	Residential	\$	0
	Commercial	\$	<u>0</u>
	Total	\$	0

AMI / Smart Grid	Residential	\$	0
	Commercial	\$	<u>0</u>
	Total	\$	0

Allocation between Residential and Commercial	Residential	\$	0
	Commercial	\$	<u>0</u>
	Total	\$	0

**Louisville Gas and Electric Company
Gas Tariffs
Red-line Version**

Exhibit RMC-3

Louisville Gas and Electric Company

P.S.C. Gas No. 9, ~~Second Revision of Original Sheet No. 86.4~~
Canceling P.S.C. Gas No. 9, ~~First Revision of Original Sheet No. 86.4~~

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Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

PROGRAMMATIC CUSTOMER CHARGES

Residential Customer Program Participation Incentives:

The following Demand Side Management programs are available to residential customers receiving service from the Company on the RGS and VFD Standard Gas Rate Schedules.

Residential Conservation / Home Energy Performance Program

The on-site audit offers a comprehensive audit from a certified auditor and incentives for residential customers to support the implementation of energy saving measures for a fee of \$25. Customers are eligible for incentives ~~ranging from \$150 to \$1,000~~ based on customer purchased and installed energy efficiency measures and validated through a follow-up test.

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Residential Low Income Weatherization Program (WeCare)

The Residential Low Income Weatherization Program (WeCare) is an education and weatherization program designed to reduce energy consumption of LG&E's low-income customers. The program provides energy audits, energy education, ~~and~~ blower door tests, and installs weatherization and energy conservation measures. Qualified customers could receive energy conservation measures ranging from \$0 to \$2,100 based upon the customer's most recent twelve month energy usage and results of an energy audit.

T

Smart Energy Profile

The Smart Energy Profile Program provides a portion of LG&E's highest consuming residential customers with a customized report of tips, tools and energy efficiency programming recommendations based on individual household energy consumption. These reports are benchmarked against similar ~~local~~ properties. The report will help the customer understand and make better informed choices as it relates to energy usage and the associated costs. Information presented in the report will include a comparison of the customer's energy usage to that of similar houses (collectively) and a comparison to the customer's own energy usage in the prior year.

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Deleted: Residential New Construction Program¶

The Residential New Construction program is designed to reduce residential energy usage and facilitate market transformation by creating a shift in builders' new home construction to include energy-efficient construction practices. Builders who are part of the program can take advantage of technical training classes, gain additional exposure to potential customers and receive incentives to help offset costs when including more ¶ energy-efficient features during home construction. LG&E will reimburse the cost of plan reviews and inspection costs related to an Energy Star or HERS home certification. ¶

Deleted: January 31, 2013

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Deleted: Lonnie E. Bellar

DATE OF ISSUE: ~~January 17, 2014~~

DATE EFFECTIVE: ~~February 16, 2014~~

ISSUED BY: /s/ ~~Edwin R. Staton~~, Vice President
State Regulation and Rates
Louisville, Kentucky

Louisville Gas and Electric Company

P.S.C. Gas No. 9, Second Revision of Original Sheet No. 86.5
Canceling P.S.C. Gas No. 9, First Revision of Original Sheet No. 86.5

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Adjustment Clause DSM Demand-Side Management Cost Recovery Mechanism

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign and an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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PROGRAMMATIC CUSTOMER CHARGES
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Commercial Customer Program Participation Incentives:

The following Demand Side Management programs are available to commercial customers receiving service from the Company on the CGS, IGS, AAGS, FT, TS, and TS-2 Standard Gas Rate Schedules and Riders.

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The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs.¶

¶

Customer Education and Public Information

This program helps customers make sound energy-use decisions, increase control over energy bills and empower them to actively manage their energy usage. Customer Education and Public Information is accomplished through three processes: a mass-media campaign, an elementary- and middle-school program, and training for home construction professionals. The mass media campaign includes public-service advertisements that encourage customers to implement steps to reduce their energy usage. The elementary and middle school program provides professional development and innovative materials to K-8 schools to teach concepts such as basic energy and energy efficiency concepts. The training for home construction professionals provides education about new building codes, standards and energy efficient construction practices which support high performance residential construction.

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Deleted: Dealer Referral Network¶
The Dealer Referral Network assists customers in identifying qualified service providers to install energy efficiency improvements recommended and/ or subsidized by the various energy efficiency programs.¶

DATE OF ISSUE: January 17, 2014

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DATE EFFECTIVE: February 16, 2014

Deleted: January 1, 2013

ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Louisville, Kentucky

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Public Service Commission in Case No. ¶
2012-00222 dated December 20, 2012

Louisville Gas and Electric Company

P.S.C. Gas No. 9, ~~Third~~ Revision of Original Sheet No. 86.6
Canceling P.S.C. Gas No. 9, ~~Second~~ Revision of Original Sheet No. 86.6

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Adjustment Clause **DSM**
Demand-Side Management Cost Recovery Mechanism

Monthly Adjustment Factors:

Residential Rate RGS and Volunteer Fire Department Rate VFD

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.01798 per Ccf
DSM Revenues from Lost Sales (DRLS)	\$ 0.00473 per Ccf
DSM Incentive (DSMI)	\$ 0.00083 per Ccf
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00000 per Ccf
DSM Balance Adjustment (DBA)	\$ 0.00104 per Ccf
Total DSMRC for Rates RGS and VFD	\$ 0.02458 per Ccf

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Commercial Customers Served Under Firm Commercial Gas Service Rate CGS, As-Available Gas Service Rate AAGS, Firm Transportation Rate FT, Gas Transportation Service/Standby Rider TS, and Gas Transportation Service/Firm Balancing Service Rider TS-2

Energy Charge

DSM Cost Recovery Component (DCR)	\$ 0.00089 per Ccf
DSM Revenues from Lost Sales (DRLS)	\$ 0.00000 per Ccf
DSM Incentive (DSMI)	\$ 0.00000 per Ccf
DSM Capital Cost Recovery Component (DCCR)	\$ 0.00000 per Ccf
DSM Balance Adjustment (DBA)	\$ 0.00009 per Ccf
Total DSMRC for Rates CGS, AAGS, FT, TS, and TS-2	\$ 0.00098 per Ccf

DATE OF ISSUE: ~~January 17, 2014~~

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DATE EFFECTIVE: ~~February 16, 2014~~

Deleted: December 31, 2013

ISSUED BY: /s/ Edwin R. Staton, Vice President
State Regulation and Rates
Louisville, Kentucky

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

**JOINT APPLICATION OF LOUISVILLE GAS)
AND ELECTRIC COMPANY AND KENTUCKY)
UTILITIES COMPANY FOR REVIEW,)
MODIFICATION, AND CONTINUATION OF)
EXISTING, AND ADDITION OF NEW,)
DEMAND-SIDE MANAGEMENT AND ENERGY)
EFFICIENCY PROGRAMS)**

CASE NO. 2014-00003

**DIRECT TESTIMONY OF
MICHAEL E. HORNUNG
MANAGER, ENERGY EFFICIENCY PLANNING/DEVELOPMENT
LG&E AND KU SERVICES COMPANY**

Filed: January 17, 2014

1 **Q. Please state your name, position and business address.**

2 A. My name is Michael E. Hornung. I am the Manager, Energy Efficiency
3 Planning/Development, for LG&E and KU Services Company, which provides
4 services to Louisville Gas and Electric Company (“LG&E”) and Kentucky Utilities
5 Company (“KU”) (collectively “Companies”). My business address is 220 West
6 Main Street, Louisville, Kentucky. A complete statement of my education and work
7 experience is attached to this testimony as Appendix A.

8 **Q. Have you ever testified before the Commission?**

9 A. Yes, I testified before the Commission most recently in Case No. 2011-00134
10 concerning the review, modification, continuation, and addition of new demand-side
11 management and energy efficiency (“DSM/EE”) programs.¹ In addition, I have
12 assisted with preparing responses to interrogatories and reports to the Commission
13 and the Virginia State Corporation Commission.

14 **Q. What is the purpose of your testimony?**

15 A. The purpose of my testimony is to describe the historical performance of the
16 Companies’ DSM/EE programs and the Companies’ proposed modifications to those
17 programs to assist customers with their energy usage. Also, I describe the processes
18 and studies the Companies used to develop the proposed modifications.

19 **Q. Are you sponsoring any exhibits to your testimony?**

20 A. Yes, attached to my testimony are Exhibits MEH-1, MEH-2, and MEH-3. Exhibit
21 MEH-1 is the Companies’ 2015-2018 Demand-Side Management and Energy
22 Efficiency Program Plan (“Proposed DSM/EE Program Plan”), which discusses the

¹ *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New Demand-Side Management and Energy-Efficiency Programs*, Case No. 2011-00134, Direct Testimony of Michael E. Hornung (April 14, 2011).

1 historical performance of the Companies’ DSM/EE programming, describes the
2 process by which the Companies developed the Proposed DSM/EE Program Plan,
3 and presents the analyses supporting the plan. David E. Huff is co-sponsoring
4 Exhibit MEH-1.

5 Exhibit MEH-2 is the Louisville Electric and Gas/Kentucky Utility Company
6 *DSM Program Review* (“*Program Review*”) by The Cadmus Group, Inc. (“Cadmus”).
7 The Companies engaged Cadmus for the purpose of providing an independent review
8 of the Companies’ existing DSM/EE portfolio and providing recommendations about
9 economical portfolio enhancements. The *Program Review* provides analysis that
10 independently supports enhancing some DSM/EE programs and allowing others to
11 expire.

12 Exhibit MEH-3 is the *Energy and Efficiency Potential Study* (“*EE Potential*
13 *Study*”), also by Cadmus. The *EE Potential Study* explores the potential of energy
14 efficiency programming in the Companies’ service territory and quantifies the amount
15 of energy and demand that could be saved in the Companies’ service territory from
16 2014 to 2033.

17
18 **Explanation of DSM/EE Programs and the Companies’ History with Them**

- 19 **Q. Please provide a brief history of the Companies’ DSM/EE programs.**
20 A. The Companies have a nearly 20-year history with DSM/EE programs. In 1994, the
21 Companies implemented their initial DSM/EE programs based on the input from their
22 Energy Efficiency Advisory Group (“EE Advisory Group”). Since then, the
23 Companies have worked with their EE Advisory Group to grow and improve the
24 Companies’ DSM/EE programs in five subsequent DSM/EE filings. The

1 Commission approved the Companies' previous DSM/EE proposals in 1994, 1996,
2 1998, 2001, 2008, and 2011.

3 Today, the Companies have a suite of successful DSM/EE programs, which
4 the Commission approved in its November 9, 2011 Order in Case No. 2011-00134.²
5 The Companies' current DSM/EE programs and the dates through which the
6 Commission has approved them are:

7 Approved through the end of 2018

8 Smart Energy Profile Program

9 Residential Refrigerator Removal Program

10 Residential Incentive Program

11 Program Development and Administration

12 Residential Conservation/Home Energy Performance Program

13 Residential Low Income Weatherization Program ("WeCare")

14 Residential and Commercial Load Management/Demand Conservation

15 Commercial Conservation/Commercial Incentives Program

16 Approved through the end of 2014

17 Residential High Efficiency Lighting

18 Residential New Construction

19 Residential and Commercial HVAC Diagnostic and Tune-up

20 Customer Education and Public Information

21 Dealer Referral Network

22 **Q. How have the Companies' current DSM/EE programs performed to date?**

² *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New Demand-Side Management and Energy-Efficiency Programs*, Case No. 2011-00134, Order (Nov. 9, 2011).

1 A. Through November 2013, the Companies' DSM/EE programs have produced
2 cumulative energy and gas savings of approximately 650 GWh and 2 million ccf,
3 along with a cumulative demand reduction of 331 MW.
4

5 **Demand-Side Management/Energy Efficiency Programs Review**

6 **Q. Have the Companies reviewed their DSM/EE programming on an ongoing**
7 **basis?**

8 A. Yes, the Companies have continued to evaluate their current DSM/EE programming
9 and actively engage in a continuous improvement process for programming and
10 practice evaluation, measurement, and verification ("EM&V"). Ongoing EM&V
11 provides opportunities for continuous review and increasingly beneficial
12 programming. Furthermore, the Companies have commissioned studies to evaluate
13 the impacts of current DSM/EE programming and the future potential of their
14 proposed DSM/EE programming.³

15 **Q. Has any research been conducted to understand the market potential for energy-**
16 **efficiency programming in the service territory?**

17 A. Yes, the Companies commissioned Cadmus to conduct the *EE Potential Study* as
18 ordered by the Commission in Case No. 2011-00375.⁴ An accurate copy of the *EE*

³ The Companies have commissioned two studies of their DSM/EE portfolio, the first performed by ICF International in 2011 and the second performed by Cadmus in 2013. The Companies provided the first study to the Commission in the Companies' Application for their 2012-18 DSM/EE Plan in Case No. 2011-00134, *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New Demand-Side Management and Energy Efficiency Programs*. The 2013 Cadmus study is attached to this testimony as Exhibit MEH-2.

⁴ *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity and Site Compatibility Certificate for the Construction of a Combined Cycle Combustion Turbine at the Cane Run Generating Station and the Purchase of Existing Simple Combustion Turbine Facilities from Bluegrass Generation Company, LLC in LaGrange, Kentucky*, Case

1 *Potential Study* is attached hereto as Exhibit MEH-3. The *EE Potential Study*
2 explored the potential of energy efficiency programming in the Companies’ service
3 territory and quantified the amount of energy and demand that could be saved in the
4 Companies’ service territory from 2014 to 2033. The *EE Potential Study* focused
5 primarily on efficiency technologies and practices widely commercially available at
6 the time of the assessment, while accounting for known changes in codes and
7 standards, technical limitations, total resource cost effectiveness, and customers’
8 willingness to adopt efficiency measures.

9 **Q. Please briefly describe the results of the study and the impact on future energy-**
10 **efficiency programming by the Companies.**

11 A. The *EE Potential Study* results indicate a range of 941 GWh to 1,478 GWh of
12 achievable electricity savings by 2033, representing 3.9% to 6.1% of retail sales in
13 2033, and a range of 15 million to 25 million therms of achievable natural gas savings
14 by 2033, representing 5% to 9% of retail sales in 2033. The *EE Potential Study* noted
15 also that, due to the Companies’ active marketing, advertising efforts, and
16 relationships with trade allies, the Companies are rapidly depleting the achievable
17 energy efficiency potential in their service territories. As the *EE Potential Study*
18 notes, the Companies are currently on track to exhaust their achievable energy
19 efficiency potential by 2018.

20 But the Companies’ rapid depletion of their currently achievable energy-
21 efficiency potential does not mean there is no need for ongoing DSM/EE program
22 planning. Program planning relies on assumptions about future market conditions,

No. 2011-00375, Order at 18-21 (May 3, 2012) (“[The Companies] shall file with the Commission the [DSM/EE] potential or market characterization study as recommended in the ICF Report.”).

1 achievable potential, and consumers’ behavior, all of which change over time. As the
2 programs continue to operate, the Companies will perform ongoing impact evaluation
3 focusing on quantifying the energy and demand savings and other economic benefits
4 of the DSM/EE portfolio. Therefore, the Companies will continue to monitor
5 marketplace changes and, after evaluation, request approval for additional or revised
6 programming as such programming becomes economical.

7 **Review of the Companies’ Current and Proposed DSM/EE Portfolio**

8 **Q. Do the Companies consult with other parties when determining which DSM/EE**
9 **programs to propose and implement?**

10 A. Yes. As I noted above, the Companies retained Cadmus to analyze the Companies’
11 existing DSM/EE program portfolio for possible enhancements, additions, or
12 revisions. Cadmus performed its analysis with input from the Companies and their
13 EE Advisory Group, and drafted the *Program Review* to provide the results of its
14 analysis to the Companies. Cadmus performed the *Program Review*
15 contemporaneously with the *EE Potential Study*, and included a review of the
16 Companies’ existing programming, a gap analysis, and recommendations for
17 programming going forward. The objective of the *Program Review* was to provide
18 options for consideration to improve program efficiency, support program expansion,
19 or capture higher energy savings. Many of the recommendations presented in the
20 *Program Review* have been incorporated in the Proposed DSM/EE Program Plan.

21 In addition, the Companies met with their EE Advisory Group to obtain
22 feedback about existing, proposed, and new programming concepts. (The Companies
23 invited all members to attend all EE Advisory Group meetings, though not all
24 members attended all meetings.) The EE Advisory Group includes representatives

1 from the Department of Energy Development and Independence, the Kentucky
2 Attorney General, community-action agencies, educational institutions, governmental
3 environmental protection agencies, and businesses.

4 In formulating this filing, the Companies held a meeting with the EE Advisory
5 Group in December 2012 to solicit feedback. The Companies discussed with the EE
6 Advisory Group their *EE Potential Study* and the efforts that were beginning to
7 develop internally as it related to the current DSM/EE portfolio. During the meeting,
8 the EE Advisory Group discussed the current programs that were scheduled to expire
9 in December 2014, forecasted program performance, and the regulatory approval
10 process. Also, the EE Advisory Group solicited feedback on potential DSM/EE
11 programs for utility analysis and how to obtain additional energy savings.

12 After completing further analysis, the Companies again met with the EE
13 Advisory Group in June 2013 to share their analysis and to obtain further feedback.
14 The Companies provided the EE Advisory Group information regarding historical
15 program performance, additional information regarding expiring DSM/EE
16 programming, the scope of the *EE Potential Study*, potential program modification
17 opportunities, and the timing of future meetings.

18 The third opportunity for the Companies to communicate with representatives
19 of various customer groups came in October 2013. The EE Advisory Group reviewed
20 energy-efficiency-programming history, preliminary results from the *EE Potential*
21 *Study*, programs expiring from the Companies' portfolio, and the Companies'
22 DSM/EE plans for 2015-2018. The October 2013 meeting included representatives
23 from the Kentucky Department for Energy Development and Independence, the

1 Community Action Council for Lexington-Fayette, Bourbon, Harrison, and Nicholas
2 Counties, the Metropolitan Housing Coalition, Jefferson County Public Schools, the
3 Kentucky School Board Association, the Home Builders Association of Louisville,
4 the Legal Aid Society of Louisville, the University of Louisville, and the Louisville
5 Metro Government.

6 The Companies' Proposed DSM/EE Program Plan is therefore the product of
7 the combined efforts of the Companies and all the parties they consulted with, most
8 notably the EE Advisory Group.

9 **Q. Do the Companies take into account their Integrated Resource Plan when**
10 **formulating DSM/EE proposals?**

11 A. Yes, the Companies have presented DSM/EE program opportunities as part of their
12 Integrated Resource Plan ("IRP"). In the last couple of IRPs the Commission Staff
13 has supported the Companies' continued expansions of their DSM/EE portfolio. The
14 Companies' current DSM/EE Program Plan, which the Commission approved in
15 2012, further increased program-participation opportunities for customers and
16 supported the Companies in meeting their IRP cumulative-demand-reduction
17 projection.

18 **The Proposed DSM/EE Program Plan**

19 **Q. What changes are the Companies proposing to their DSM/EE portfolio?**

20 A. The Companies are proposing enhancements to their Commercial Load
21 Management/Demand Conservation Program, Residential Incentives Program,
22 Commercial Conservation/Commercial Incentives Program, and Residential
23 Conservation/Home Energy Performance Program. The Companies are further
24 proposing to enhance the Customer Education and Public Information Program and to

1 extend it through the end of 2018 (its current approval extends through the end of
2 2014). The Companies are also proposing to deploy Advanced Metering Systems.

3 The Proposed DSM/EE Program Plan will maintain and operate the following
4 programs according to their current Commission-approved designs through 2018:
5 Smart Energy Profile Program, Residential Load Management/Demand Conservation,
6 Residential Refrigerator Removal Program, Program Development and
7 Administration, and Residential Low Income Weatherization Program (WeCare).

8 **Q. Why are the Companies proposing to allow certain programs to terminate at the**
9 **end of 2014?**

10 A. The Companies will allow the following programs to expire because they will have
11 reached the end of their approval cycle and useful life by the end of 2014:
12 Residential High Efficiency Lighting, Residential New Construction, Residential and
13 Commercial HVAC Diagnostic and Tune-Up, and the Dealer Referral Network. The
14 support for each program's expiration is in Exhibit MEH-1, Appendix A.

15 **Q. Do the Companies use cost-benefit tests to help determine which DSM/EE**
16 **programs to propose to continue or implement?**

17 A. Yes, the Companies rigorously analyze existing and potential DSM/EE programs
18 using the industry-standard cost-benefit tests set out in the California Standard
19 Practice Manual,⁵ which the Commission explicitly requires utilities to apply: "Any
20 new DSM program or change to an existing DSM program shall be supported by ...
21 [t]he results of the four traditional DSM cost-benefit tests [Participant, Total Resource

⁵ The Manual is available online at: http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF.

1 Cost, Ratepayer Impact, and Utility Cost tests].”⁶ The Manual defines the four tests
2 as follows:

3 • **The Participant Test:** The Participants Test is the measure of the quantifiable
4 benefits and costs to the customer due to participation in a program. Since
5 many customers do not base their decision to participate in a program entirely
6 on quantifiable variables, this test cannot be a complete measure of the
7 benefits and costs of a program to a customer.⁷

8 • **The Ratepayer Impact Measurement Test:** The Ratepayer Impact Measure
9 (RIM) test measures what happens to customer bills or rates due to changes in
10 utility revenues and operating costs caused by the program. Rates will go
11 down if the change in revenues from the program is greater than the change in
12 utility costs. Conversely, rates or bills will go up if revenues collected after
13 program implementations are less than the total costs incurred by the utility in
14 implementing the program. This test indicates the direction and magnitude of
15 the expected change in customer bills or rate levels.⁸

16 • **The Total Resource Cost Test:** The Total Resource Cost Test measures the
17 net costs of a demand-side management program as a resource option based
18 on the total costs of the program, including both the participants’ and the
19 utility’s costs. ... This test represents the combination of the effects of a
20 program on both the customers participating and those not participating in a
21 program. In a sense, it is the summation of the benefit and cost terms in the
22 Participant and the Ratepayer Impact Measure tests, where the revenue (bill)
23 change and the incentive terms intuitively cancel (except for the differences in
24 net and gross savings).⁹

25 • **The Program Administrator Cost Test (or “Utility Cost Test”):** The
26 Program Administrator Cost Test measures the net costs of a demand-side
27 management program as a resource option based on the costs incurred by the
28 program administrator (including incentive costs) and excluding any net costs
29 incurred by the participant. The benefits are similar to the TRC [Total
30 Resource Cost] benefits. Costs are defined more narrowly.¹⁰

31 The Companies performed the four traditional DSM/EE cost-benefit tests for
32 each of the programs in the Proposed DSM/EE Program Plan except the Advanced

⁶ *In the Matter of the Joint Application of the Members of the Louisville Gas and Electric Company Demand-Side Management Collaborative for the Review, Modification, and Continuation of the Collaborative, DSM Programs, and Cost Recovery Mechanism, Case No. 1997-00083, Order at 20 (Apr. 27, 1998).*

⁷ Manual at 8.

⁸ Manual at 13.

⁹ Manual at 18.

¹⁰ Manual at 23.

1 Metering Systems, which Mr. Huff discusses in his testimony. The results of the
 2 cost-benefit tests for all of the other programs in the Proposed DSM/EE Program Plan
 3 show that each program passed the Participant and Total Resource Cost tests (a score
 4 of 1.0 or greater is “passing,” meaning that the value of program’s benefits is equal to
 5 or greater than the cost of the program), as shown below:
 6

Program	DSMore Scoring			
	Participant Test	Utility Cost Test	Ratepayer Impact Test	Total Resource Cost Test
Residential Low Income Weatherization (WeCare)	N/A	2.57	0.60	2.57
Residential Load Management	N/A	1.47	1.02	2.95
Residential Refrigerator Removal	N/A	1.86	0.56	2.26
Smart Energy Profile	N/A	3.07	0.74	3.07
Program Development & Administration	N/A	0.00	0.00	0.00
Residential Conservation	6.50	2.52	0.68	1.93
Residential Incentives	3.20	4.53	0.81	2.37
Commercial Conservation	7.56	16.42	1.18	7.26
Commercial Load Management	N/A	1.64	0.86	2.27
Customer Education & Public Information	N/A	0.00	0.00	0.00
Overall Portfolio	8.66	3.13	0.86	3.07

7
 8 Also, the Companies’ proposed DSM/EE portfolio except the Advanced
 9 Metering Systems, taken as a whole, passes the Participant, Utility Cost, and Total
 10 Resource Cost Tests.

11 **Q. What are the projected overall costs and benefits of the DSM/EE program**
 12 **portfolio the Companies are proposing in this proceeding?**

13 A. The Companies project that the effect of all of their past and current DSM/EE
 14 programs, as well as those in the Proposed DSM/EE Program Plan, will be a
 15 cumulative demand reduction of 500 MW and cumulative energy and gas savings of
 16 1.6 million MWh and nearly 13.4 million ccf by 2018. The following tables show the
 17 savings broken down by year:

Incremental	Projected Energy & Demand Savings			
	2015	2016	2017	2018
MWh	196,115	196,678	199,165	200,261
MW	59	57	58	58
CCF	2,480,986	2,535,279	2,632,202	2,717,998

Cumulative	Projected Energy & Demand Savings				
	Portfolio Pre - 2015	2015	2016	2017	2018
MWh	832,709	1,028,824	1,225,502	1,424,667	1,624,929
MW	340	388	425	463	500
CCF	3,014,996	5,495,982	8,031,261	10,663,463	13,381,461

Case 2011-00134 Cumulative	Projected Energy & Demand Savings							
	Portfolio Pre - 2011	2012	2013	2014	2015	2016	2017	2018
MWh	206,482	380,693	365,951	562,890	806,659	1,006,871	1,208,179	1,410,584
MW	182	231	281	325	378	416	453	491
CCF	806,524	1,638,358	2,381,163	4,027,556	6,564,420	9,056,652	11,634,680	14,298,503

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To achieve these benefits, the Companies project a total DSM/EE portfolio and Advanced Metering Systems cost of \$179 million from 2015 to 2018. The proposed annual budget per program per year is provided in the following table. The amount approved by the Commission in Case No. 2011-00134 for years 2015 to 2018 is \$155 million. The Companies are requesting an additional \$24 million in this proposal to support modifications to the Commercial Load Management Program/Demand Conservation Program, Residential Incentives Program, Commercial Conservation/Commercial Incentive Program, and Residential Conservation Program/Home Energy Performance Program. These funds will also support the continuation of the Companies' Customer Education and Public Information Program through the end of 2018, as well as the implementation of Advanced Metering Systems.

DSM / EE Program O&M (\$000's)	2015	2016	2017	2018	Total
Existing					
Smart Energy Profile	\$3,311	\$3,344	\$3,433	\$3,468	\$13,555
Residential Load Management	\$9,865	\$10,073	\$10,443	\$10,877	\$41,257
Residential Refrigerator Removal	\$2,037	\$2,068	\$2,150	\$2,211	\$8,466
Residential Low Income Weatherization (WeCare)	\$4,947	\$5,887	\$6,862	\$7,843	\$25,539
Program Development & Administration	\$1,373	\$1,421	\$1,471	\$1,522	\$5,788
Revised					
Commercial Load Management	\$946	\$1,252	\$1,564	\$1,882	\$5,643
Residential Incentives	\$4,108	\$4,086	\$4,094	\$4,133	\$16,422
Customer Education & Public Information	\$4,043	\$4,110	\$4,194	\$4,295	\$16,643
Residential Conservation	\$2,255	\$2,250	\$2,289	\$2,361	\$9,156
Commercial Conservation	\$3,339	\$3,369	\$3,400	\$3,431	\$13,538
Overall Portfolio O&M	\$36,223	\$37,861	\$39,899	\$42,023	\$156,006

DSM / EE Program Capital (\$000's)	2015	2016	2017	2018	Total
Existing					
Residential Load Management Capital	\$3,957	\$3,528	\$3,597	\$3,668	\$14,750
Revised					
Commercial Load Management Capital	\$631	\$644	\$657	\$670	\$2,601
Overall Portfolio Capital	\$4,588	\$4,172	\$4,254	\$4,338	\$17,351

	2015	2016	2017	2018	Total
TOTAL Portfolio Budget (\$000's)	\$40,811	\$42,033	\$44,153	\$46,360	\$173,358

Case 2011-00134 (\$000's)	2015	2016	2017	2018	Total
O&M Expenses	\$40,287	\$31,528	\$33,186	\$34,909	\$139,910
Capital Expenses	\$4,151	\$3,681	\$3,753	\$3,827	\$15,411
Total Budget	\$44,438	\$35,209	\$36,939	\$38,736	\$155,321

Difference (\$000's)	2015	2016	2017	2018	Total
O&M Expenses	(\$4,064)	\$6,334	\$6,713	\$7,114	\$16,097
Capital Expenses	\$437	\$491	\$501	\$511	\$1,941

Advanced Metering Systems	2015	2016	2017	2018	Total
O&M Expenses	\$442	\$549	\$556	\$333	\$1,879
Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830
Total Budget	\$825	\$1,698	\$1,705	\$1,482	\$5,709

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2 **Q. What monthly bill impact will the Companies' proposed DSM/EE portfolio have**
3 **on an average residential customer?**

4 A. The Companies project that the monthly bill impact of the new DSM/EE programs
5 and program enhancements will be \$4.68 for LG&E residential electric customers and
6 \$3.78 for KU residential electric customers using 1,000 kWh per month. The current

1 DSM/EE charge for LG&E residential electric customers is \$4.39 and \$3.49 for KU
2 residential electric customers. In other words, an LG&E or KU electric customer
3 using 1,000 kWh per month will see a DSM/EE-related bill increase of \$0.29 per
4 month.

5 The Companies project that the monthly gas bill impact of the new DSM/EE
6 programs and program enhancements will be \$1.72 for LG&E residential gas
7 customers using 70 ccf per month. The current DSM/EE charge for LG&E
8 residential gas customers is \$1.50. In other words, an LG&E gas customer using 70
9 ccf per month will see a DSM/EE-related bill increase of \$0.22 per month.

10 **Summaries and Evaluations of Existing Programs to Be Continued with Modifications**

11 **Q. Please describe the Commercial Load Management/Demand Conservation**
12 **Program and the changes the Companies propose to make to it.**

13 A. The Commercial Load Management/Demand Conservation Program is a voluntary
14 program that supports the Companies by reducing peak demand when energy
15 consumption is at its highest. In operation since 2001, the program utilizes switches
16 to cycle central air conditioning systems, heat pumps, electric water heaters, or pool
17 pumps in small commercial properties.

18 Through the existing approved budget associated with their Commercial Load
19 Management/ Demand Conservation Program, the Companies launched a large
20 commercial load management effort in 2012 to evaluate available control
21 technologies and customer participation. The small-scale effort included eighteen
22 (18) large commercial companies representing over eighty-four (84) sites across the
23 service territory. Sites participating in the program include retail, schools, utilities,

1 local government, and distribution facilities. These enrolled sites have yielded nearly
2 a 10 MW demand reduction in the 2013 load control season.

3 With the demonstrated success of the large commercial technologies, the
4 Companies seek to enhance the Commercial Load Management/Demand
5 Conservation Program by moving the large commercial load management effort to a
6 full commercial deployment and being able to modify financial incentives to
7 encourage customers to participate in this voluntary program capped at the approved
8 program budgets. The expansion of the Commercial Load Management / Demand
9 Conservation Program to include large commercial customers will allow the
10 Companies to further reduce electricity usage during peak times. Based on the
11 participation and achievable demand reduction, the implementation of a full scale
12 large commercial deployment would further support the Companies' efforts in
13 delaying new generation assets. In addition to the benefits to the Companies,
14 customers who participate in this program will benefit from equipment installation
15 that provides real-time monitoring capabilities to educate customers on day-to-day
16 energy use. This information can help customers identify additional opportunities to
17 use energy more efficiently.

18 The small commercial program goals have been reduced to allow for
19 increased focus on the large commercial program. The large commercial program is
20 designed to add 5 MW of demand response per year from 2015 to 2018. The
21 Companies will target an equal participation split between LG&E and KU.
22 Commercial customer annual participation goals for both programs are 50 customers
23 each. If all participation goals are met by the end of 2018, the Commercial Load

1 Management / Demand Conservation Program’s potential for controllable load would
2 represent a resource for the Companies to reduce peak demand and delay the need for
3 additional generating resources.

4 **Q. Please explain why the Companies did not request this modification to their**
5 **Residential Load Management/Demand Conservation Program in Case No.**
6 **2011-00134.**

7 A. At that time, the Companies were still exploring how a large commercial load control
8 program could evolve, which potential technologies to utilize, which contractors
9 should support the program launch, and whether there was enough interest among
10 large commercial customers to justify a full scale deployment. Since November
11 2011, the Companies have effectively launched a small-scale large-commercial effort.
12 The participating large commercial customers created enough load reduction through
13 the 2013 cooling season to warrant implementing a full-scale large-commercial
14 deployment that would further support the Companies’ efforts in delaying additional
15 generation assets.

16 **Q. Please describe the Residential Incentives Program and the changes the**
17 **Companies propose to make to it.**

18 A. The Commission approved the Residential Incentives Program in Case No. 2011-
19 00134. The program’s goal is to encourage the residential customer segment to
20 purchase more efficient ENERGY STAR[®] appliances by providing rebates ranging
21 from \$50 to \$300 to residential electric customers to offset the costs of purchasing
22 certain ENERGY STAR[®] qualified appliances, high-efficiency HVAC systems, and
23 qualified window film. To participate, residential customers submit a completed

1 rebate application along with appropriate purchase documentation. After the
2 Companies approve a customer's rebate application, the Companies send the
3 customer a rebate check.

4 The Residential Incentives Program has experienced success since its
5 inception due to its simple design and the variety of eligible appliances. Through
6 November 2013, the Companies have surpassed their anticipated rebated appliances
7 by 125% and their forecasted budget by 107%.

8 To address the exceedingly high customer participation and prevent early
9 program termination, the Companies seek approval for an increased incentive budget
10 to fund the program through 2018. The Companies' goal is to have 35,100 rebates
11 annually in LG&E and KU's combined service territory. If the Companies can
12 achieve their goal, the Residential Incentives Program should achieve cumulative
13 energy savings of almost 100,884 MWh and a demand reduction of 16.3 MW.

14 **Q. Please describe why the Companies are requesting such a significant increase in**
15 **incentive funds.**

16 A. As a result of a simple programmatic design and the variety of appliances rebated, the
17 Companies have witnessed an unexpectedly high level of customer participation in
18 the Residential Incentive Program. Through November 2013, the Companies have
19 seen 32,466 rebates processed, almost triple the original forecast of 12,500. Based on
20 program performance and support identified in the *Program Review*, the Companies
21 are requesting additional funds to support the continuation of this highly utilized
22 program through its approved 2018 funding cycle.

1 **Q. Please describe the Commercial Conservation/Commercial Incentives Program**
2 **and the changes the Companies propose to make to it.**

3 A. The Commission approved the Commercial Conservation/Commercial Incentives
4 Program in Case No. 2011-00134. As currently approved, the Commercial
5 Conservation/Commercial Incentives Program provides participating commercial
6 customers a better understanding of their energy consumption through energy audits
7 and recommendations on energy-efficiency improvements. The Companies’
8 commercial customers also have the opportunity to apply for financial incentives to
9 assist with replacing aging and less-efficient equipment through prescriptive or
10 customized rebates.

11 The proposed filing enhancements are responsive to needs of the commercial
12 customer segment. The Companies seek to enhance this program in several ways: (1)
13 eliminating the on-site commercial audits; (2) further developing their online audit
14 tool as well as additional special-purpose energy tools to support commercial
15 customers; (3) providing rebates for new construction efforts where efficiency is
16 above standard building code; and (4) reducing demand reduction and the associated
17 rebate funding.

18 The Companies intended the on-site energy audit component of the
19 Commercial Conservation/Commercial Incentives Program to provide commercial
20 customers a better understanding of their energy consumption and provide
21 recommendations on energy-efficiency improvements. The Companies’ plan was to
22 provide commercial customers the means to identify improvements on the assumption
23 that participating commercial customers would then take advantage of available

1 incentives to help offset improvement costs. Contrary to that assumption, the
2 Companies have seen only a 6.5% conversion rate between the amount of on-site
3 energy audits completed and the number of incentives submitted by commercial
4 customers. In addition, one of the findings in the *Program Review* was the realization
5 of fewer economic and achievable measures due to the current market conditions and
6 costs. Therefore, the Companies propose to reduce their prior approved annual
7 commercial incentive amount from \$2.0 million to \$1.5 million. Although the
8 Companies are requesting to eliminate onsite commercial audits from the DSM/EE
9 portfolio, they intend to rebate commercial customers who have an onsite commercial
10 audit independently and implement recommended energy saving measures. In
11 addition, the Companies propose to provide an online tool for their Business Service
12 Centers and commercial customer segment to allow customers to obtain
13 recommendations for energy-efficiency improvements. This effort will allow the
14 Companies' representatives to become better advocates for energy efficiency
15 programming and further support commercial customer goals. Furthermore,
16 encouraging new construction efforts to implement design options for efficient
17 construction that are above building code will further increase energy savings.

18 If the Companies can achieve these goals, they should achieve cumulative
19 energy and gas savings by the end of 2018 of 173,304 MWh and 391,881 ccf, and a
20 demand reduction of 63.37 MW.

21 **Q. Please describe the Companies' proposal to enhance and extend their Customer**
22 **Education and Public Information Program.**

1 A. The Commission approved the Customer Education and Public Information Program
2 through 2014 in Case No. 2007-00319. The Companies fully implemented the
3 Customer Education and Public Information in 2009 with a successful marketing
4 campaign and school-based education program. The Companies implemented the
5 program to increase public awareness and understanding of both the urgent need for
6 more efficient use of energy and the environmental and financial impacts created by
7 climate change issues. The Companies implemented the Customer Education and
8 Public Information Program throughout their service territories.

9 To address the continuing need for education and increased public awareness
10 and understanding of both the urgent need for more efficient use of energy and the
11 financial impacts created by increased usage, the Companies are seeking approval for
12 continuation in the following aspects: (1) continuing funds that will allow for further
13 outreach to the current residential and commercial segments through mass media
14 outlets and “future customer” education efforts through school based programming;
15 (2) adding training opportunities for home construction professionals; and (3)
16 extending the Customer Education and Public Information Program through 2018.

17 The Customer Education and Public Information Program increases customer
18 awareness and encourages utilization of energy efficiency products and services.
19 Both current and potential future consumers learn and understand the cost advantages
20 of addressing electrical system load growth by embracing energy efficiency and
21 demand response programs relative to the higher costs associated with adding
22 generating assets and environmental compliance. The program’s continuing efforts
23 will inform consumers that energy efficiency initiatives can provide opportunities for

1 them to maintain their comfort and level of service while reducing energy
2 consumption. The program will also continue to inform that participation in
3 developed energy efficiency programs costs less than construction of new power
4 plants and has less negative impact on utility rates and the environment.

5 **Q. Please describe the Residential Conservation/Home Energy Performance**
6 **Program and the changes the Companies propose to make to it.**

7 A. The Commission approved the Residential Conservation / Home Energy Performance
8 Program in Case No. 2011-00134. The current Residential Conservation/Home
9 Energy Performance Program provides an onsite energy audit by a certified energy
10 analyst who assesses the home's efficiency and provides a report with energy saving
11 improvement recommendations. Residential customers who achieve up to 30% more
12 efficiency in the home through implementation of energy saving improvements are
13 eligible for up to \$1,000 in incentives to offset installation costs.

14 The Companies seek to enhance this program by implementing a tier structure
15 for multi-family properties and implementing a tier structure for insulation and
16 weatherization efforts as identified in the *Program Review*. There will be no
17 additional funding requested or energy or demand reductions from the requested
18 enhancements; the requested enhancements will operate under the approved budgets
19 in Case No. 2011-00134.

20 The Residential Conservation/Home Energy Performance Program as
21 proposed will allow a multi-family property incentive tier in the Residential
22 Conservation/Home Energy Performance Program. The addition of a multi-family
23 property incentive tier structure will build upon the existing Residential

1 Conservation/Home Energy Performance Program to capture energy saving in a
2 multi-family environment. The proposed insulation and weatherization tier is for the
3 homeowner who implements insulation and weatherization measures identified in the
4 completed onsite audit report.

5 The program's proposed participation goals are the same as those approved in
6 Case No. 2011-00134. The goal for online participants will be 3,000 customers per
7 year per utility through 2018. The goal for onsite participants will be 1,000 customers
8 per year per utility through 2018. If the Companies can achieve these goals, they
9 should achieve cumulative energy savings by the end of 2018 of 20,658 MWh, a
10 demand reduction of 5.3 MW, and gas savings of 660,122 ccf.

11 **Discussion of Existing Programs to Be Continued without Modification**

12 **Q. What are the current DSM/EE programs the Companies do not propose to**
13 **change or extend at this time, and why?**

14 A. The Companies propose to continue the following Commission-approved programs
15 without change through 2018: Smart Energy Profile Program, Residential Load
16 Management/Demand Conservation, Residential Refrigerator Removal Program,
17 Residential Low Income Weatherization Program (WeCare), and Program
18 Development and Administration. A brief summary of each of these programs and
19 its performance to date is included in the Proposed DSM/EE Program Plan. These
20 programs do not require change or extension at this time due to changed
21 circumstances or insufficient data supporting changes or extensions. Therefore, the
22 Companies will continue these programs per the authority the Commission granted in
23 Case No. 2011-00134; however, the Companies will continue to analyze these

1 programs and may request enhancements to, or extensions of, these programs in later
2 DSM/EE filings.

3

4 **Ensuring the Value and Performance of the Companies' DSM/EE Programs**

5 **Q. How do the Companies ensure that their DSM/EE programs remain effective**
6 **after they are approved and implemented?**

7 A. The Companies recognize the value in having a continuous improvement process for
8 programming and practice EM&V. Currently, the Companies use a third-party
9 contractor to examine program design, delivery, impacts, and return on investment.
10 This contractor ensures quality and effectiveness of the programs, optimal use of
11 resources, and responsiveness to customers' needs.

12 The Companies will use the results and guidance to ensure that all of the
13 programs contained in this filing remain prudent, demonstrate continuous
14 improvement, and remain a good application of customer dollars. The Companies
15 typically evaluate their DSM/EE programs in two phases, process evaluation and
16 impact evaluation. Process evaluation is a systematic assessment of an energy
17 efficiency program for the purposes of improving its design, delivery, and perceived
18 quality and usefulness to customers. Impact evaluation focuses on quantifying the
19 energy and demand savings and other economic benefits of the program. If the
20 Companies' reviews reveal any program to be cost-ineffective or otherwise
21 underperforming, the Companies will discontinue the program and notify the
22 Commission by a letter or motion.

Recommendation and Conclusion

1

2 **Q. What is your recommendation concerning the Companies' Application for their**
3 **Proposed DSM/EE Program Plan?**

4 A. I recommend that the Commission approve the Companies' Application. The
5 Companies have seen impressive results from their DSM/EE programs to date, and
6 they can continue to achieve such results with additional investment and expanded
7 program offerings.

8 **Q. Does this conclude your testimony?**

9 A. Yes.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Michael E. Hornung**, being duly sworn, deposes and says that he is Manager of Energy Efficiency Planning & Development for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.



Michael E. Hornung

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 17th day of January 2014.



Notary Public (SEAL)

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State of Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

APPENDIX A

Michael E. Hornung

LG&E and KU Services Company
220 West Main Street
Louisville, Kentucky 40202

Education

Bachelor of Science in Business Administration; University of Louisville	August 1992
E.ON Strategic Business Integration: Generation & Energy Marketing	August 2009

Professional Experience

Louisville Gas and Electric Company and Kentucky Utilities Company

Manager, Energy Efficiency Planning & Development	August 2008 – Present
Senior Rate & Regulatory Analyst	August 2006 – August 2008
Senior Market Policy Analyst	February 2000 – August 2006
Senior Financial Analyst – Risk Management/Trading Controls	June 1999 – February 2000
Senior Accountant at LG&E Energy Marketing	1997 – 1999
Venture Accountant at LG&E Power, Inc.	1996 – 1997
General Labor, LG&E Construction	Summer 1988 & 1989

Professional Memberships

Association of Energy Services Professionals (AESP)	August 2008 – Present
Kentucky Energy Efficiency Working Group	August 2008 – Present
E-Source Technology Leadership Council	April 2010– Present
Greater Louisville Inc.: Energy Efficiency Subcommittee	October 2010 – Present
Stimulating Energy Efficiency in Kentucky (SEE KY)	October 2010 – May 2013
Consortium of Energy Efficiency (CEE)	January 2011 – Present
Midwest Energy Efficiency Alliance (MEEA)	January 2011– Present

**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

**2015-2018 Demand-Side Management and
Energy Efficiency Program Plan**

Exhibit MEH-1

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ES.0 Executive Summary

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- 2.0 Residential Incentives Program
- 3.0 Commercial Conservation / Commercial Incentive Program
- 4.0 Customer Education and Public Information
- 5.0 Residential Conservation Program / Home Energy Performance Program
- 6.0 Existing and Unchanged Programs: Smart Energy Profile Program, Residential Load Management / Demand Conservation Program, Residential Refrigerator Removal Program, Residential Low Income Weatherization Program (WeCare) and Program Development and Administration
- 7.0 Advanced Metering Systems (AMS)

**LG&E AND KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

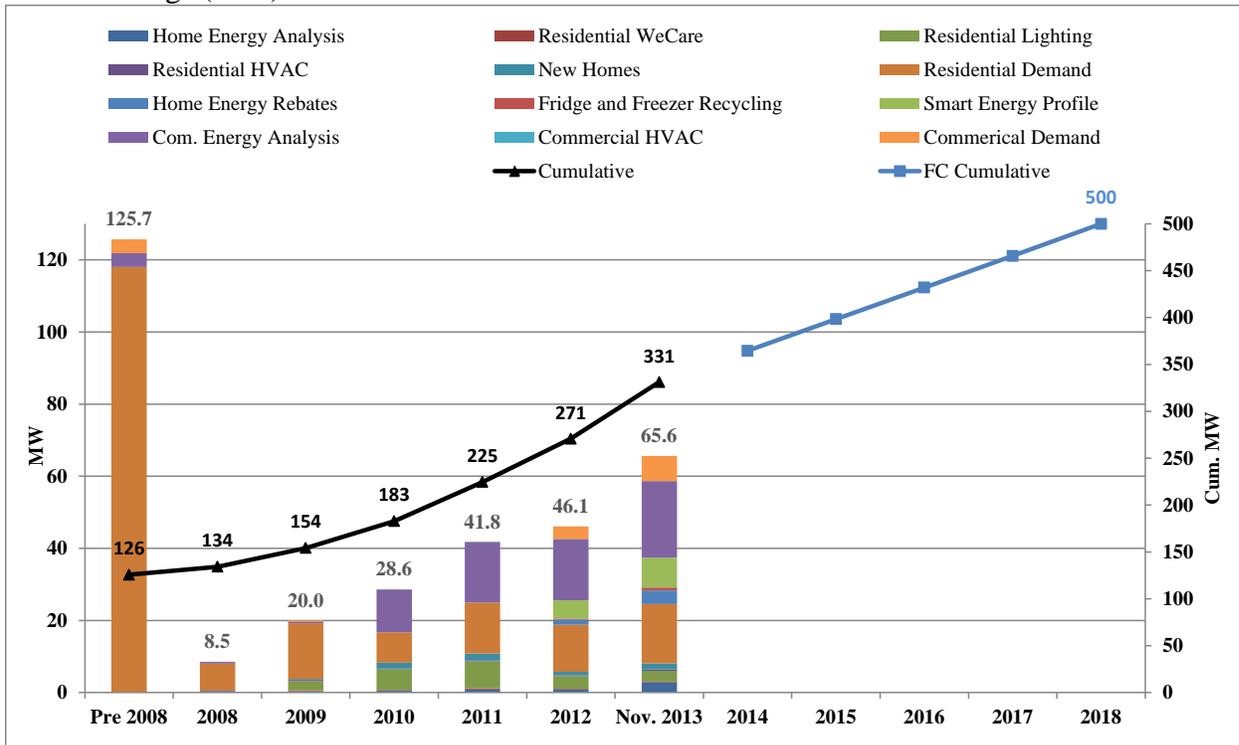
E.S 0 Executive Summary

LG&E and KU 2015-2018 DEMAND-SIDE MANAGEMENT AND ENERGY EFFICIENCY PROGRAM PLAN

ES. 1 Introduction

Louisville Gas and Electric Company (“LG&E”) and Kentucky Utilities Company (“KU”) (collectively “the Companies”) have been providing energy efficiency programming for residential and commercial customers since 1994. Through the Companies’ robust marketing, advertising, customer interactions, and relationships with Trade Allies, the value of energy efficiency programming is resonating with their customers.¹ As evidenced by the tables below, the Companies’ historical program data demonstrates year-over-year successes of their programming efforts through its associated energy and demand savings.

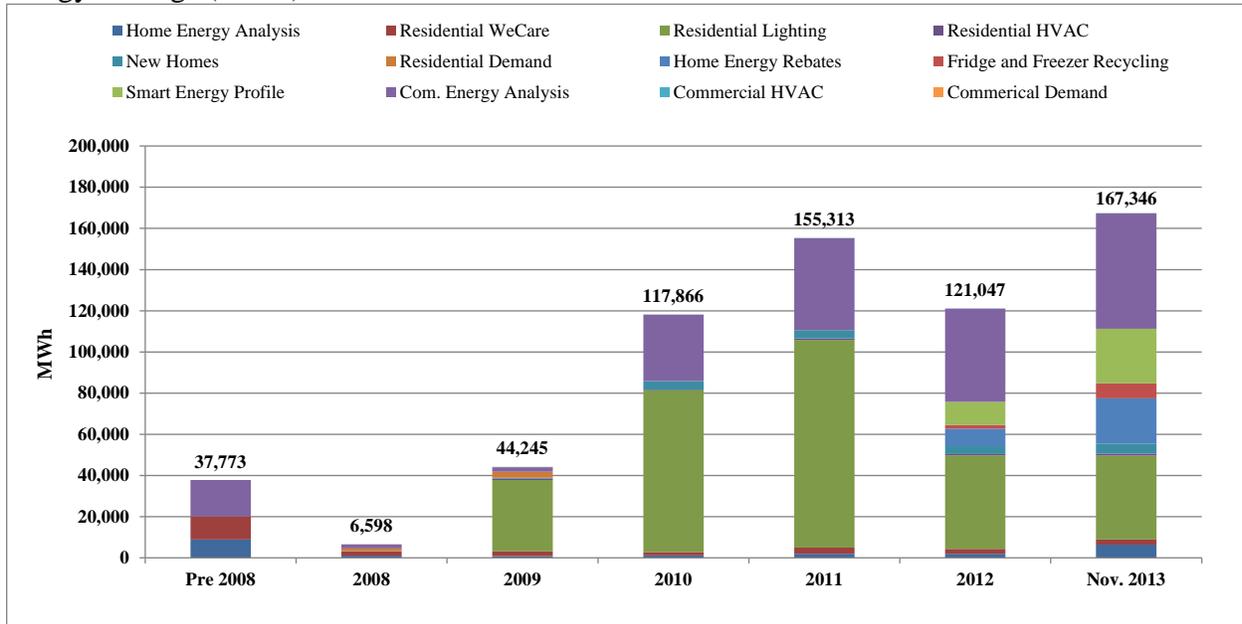
Demand Savings (MW):



The demand savings in the table above are representative of the savings through November 2013, as well as the forecasted cumulative savings through 2018 that will be achieved through the proposed 2015-2018 DSM/EE Program Plan.

¹ Trade Allies are third-parties who promote the sale or installation of qualifying high-efficiency equipment without a contractual agreement with the Companies.

Energy Savings (MWh):



The energy savings in the table above are representative of the 2013 Year to Date (YTD) savings through November.

As the Companies have continued to see value in energy efficiency and its ability to assist customers in managing their energy usage, the Companies have effectively built upon their Demand Side Management/Energy Efficiency (“DSM/EE”) plans to provide increasingly beneficial programming. Through customer interaction and educational efforts, the Companies have succeeded in meeting the varying needs of their residential and commercial customers.

The Companies’ first significant expansion of their energy-efficiency programming was in 2007.² This case sought inclusions for Residential High Efficiency Lighting, Residential New Construction, Residential and Commercial HVAC Diagnostics and Tune-Ups, Customer Education and Public Information, and a Dealer Referral Network for customers seeking installation of energy-efficiency measures. As a result of the Companies’ ongoing review of DSM/EE programs and research into possible new programs, the Companies formulated concepts for enhanced and additional DSM/EE programs to be included in 2011.³ The Companies received customer feedback that enabled the Companies to pursue DSM alternatives that were expressly responsive to the needs of their residential and commercial customers. The DSM/EE Program Plan in Case No. 2011-00134 sought the inclusion of additional energy efficiency retrofits incentives, such as refrigeration and the addition of customized commercial incentives to sustain energy efficiency retrofits not covered by the prescriptive Commercial Conservation Program.

² In the Matter of the Application of Louisville Gas and Electric Company and Kentucky Utilities Company Demand-Side Management for the Review, Modification, and Continuation of Energy Efficiency Programs and DSM Cost Recovery Mechanisms, Case No. 2007-00319, Order (March 31, 2008).

³ In the Matter of the Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of News, Demand-Side Management and Energy-Efficiency Programs, Case No. 2011-00134, Order (November 9, 2011).

Over the years, the Companies have presented demand-side-management-program opportunities as part of their Integrated Resource Plan (“IRP”). In the last couple of IRPs, the Companies have continued to grow their energy efficiency program portfolio, which the Commission staff has supported. The Companies developed the current DSM/EE Plan in collaboration with their Energy Efficiency Advisory Group that sought opportunities for new and innovative DSM programs for residential and commercial customers. The currently approved DSM/EE plan in Case No. 2011-00134 further increased program participation opportunities for customers and supports the Companies in meeting its IRP cumulative demand reduction.

Energy efficiency efforts have successfully been in place for nearly 20 years throughout the Companies’ service territories to support the residential and commercial customer segments. The year-over-year successes that the Companies have achieved are becoming more difficult to improve upon due to the high levels of customer engagement and saturation rates of program participation within the Companies’ service territories. Adoption of measures is subject to a number of constraints, primarily the customers’ willingness to adopt energy-efficiency measures, the maturity of the technology, and customer awareness. The Companies have overcome these barriers through their programmatic efforts to raise awareness and provide financial incentives. However, as the Companies implement their planned programs, the cost of achieving additional savings will likely rise as the market for certain energy-efficiency equipment becomes saturated, low-cost saving opportunities are exhausted, or baseline energy use is lowered by stringent energy-efficiency codes and standards. Thus, to achieve this remaining potential, the Companies will likely have to invest additional resources to intensify marketing efforts to the extent these additional resources can be economically justified.

In addition, while the electric utility industry has worked to educate customers on making better decisions on their energy consumption during this time period, the federal and state governments have issued legislative mandates through the Energy Independence and Security Act of 2007 (“EISA”), the American Recovery and Reinvestment Act of 2009 (“ARRA”), and the 2009 International Energy Conservation Code (“IECC”), the last of which Kentucky adopted in 2012 to update the Kentucky Building Code. These mandates have increased lighting and appliance efficiency standards, fostered the development of new building and commercial equipment standards, and encouraged an overall awareness of energy efficiency in addition to the Companies’ efforts. The amount of saturation in the marketplace and increasingly stringent standards and codes have made it difficult for the Companies to continue to obtain additional energy-efficiency savings at the same rate they have achieved in the past.

To help understand where true potential for energy efficiency programming is within the Companies’ service territories, a market potential study (“Study”) was conducted by The Cadmus Group.⁴ The assessment quantified the amount of energy and demand that could be saved in the Companies’ service territories from 2014 to 2033. The Study focused primarily on efficient technologies and practices widely commercially available at the time of the assessment, while accounting for known changes in codes and standards, technical limitations, total resource cost effectiveness, and customer willingness to adopt to assure that savings targets can be achieved.

⁴ The Companies submitted a Certificate of Public Convenience and Necessity (“CPCN”) in Case No. 2011-00375. As a result of this case, the Commission requested that the Companies explore the potential of energy efficiency in Kentucky. (Order May 3, 2012, Paragraph 5).

The Companies' ability to be provider of least cost and competitive energy create challenges for energy-efficiency programming as witnessed through The Cadmus Group potential study results. Although the relationship between avoided costs and economic potential is not perfectly linear, avoided energy and capacity costs are the key determinants of economic potential for future energy-efficiency efforts. The study results indicate a cumulative 5,390 GWh of technically feasible electric energy-efficiency potential by 2033, the end of the 20-year study horizon, with approximately 2,527 GWh (47%) of the resources proving cost-effective. As noted in the Study, due to the Companies' active marketing, advertising efforts, and relationships with Trade Allies, the Companies are rapidly depleting their available energy efficiency potential in the service territory, where at the current rate available energy efficiency will be exhausted by 2020 given current technologies. The completed energy efficiency potential study can be located in Exhibit MEH-3.

Although the Companies are currently experiencing continued successes within existing programs, the Companies are at a defining moment. The Companies find themselves in a position where several programs will be allowed to expire as a result of a large transformation in the marketplace due to the strengthening of Federal and State standards and codes associated with lighting and appliance efficiency standards, development of new building and commercial equipment standards, and a heightened overall awareness of energy efficiency.

In this proposal, the Companies seek approval for enhancements to programming in their currently approved portfolio from Case No. 2011-00134 and the continuation of one program approved in Case No. 2007-00319. The programming enhancements that will be sought will take into account aspects of certain programming that is set to expire December 31, 2014, in Case No. 2007-00319. The proposal in front of the Commission will allow the Companies to align their DSM/EE portfolio with all approved programs ending in 2018. This will allow the Companies to review their portfolio holistically in conjunction with a marketplace perspective as well as the utility cost perspective, thus allowing the Companies to evaluate additional programming with potentially new energy efficiency technologies as they become economically viable.

The 2015-2018 Program Portfolio being proposed is supported not only by the aforementioned Study, but also a separate DSM Program Review conducted by The Cadmus Group and supported through collaboration with the Companies' DSM Advisory Group. Cadmus Group was hired by the Companies to review the 2012-2018 DSM/EE Program Plan. This review was made in conjunction with the Commission-mandated Study. The DSM Program Review included, but was not limited to, a review of its existing programming, a gap analysis, and recommendations for programming going forward. The intention of the DSM Program Review was to provide options for consideration to improve program efficiency, support expansion or capture higher energy savings. Many of the recommendations presented in the DSM Program Review have been incorporated in this application filing. The DSM Program Review is presented in its entirety in Exhibit MEH-2.

In addition to third party support of The Cadmus Group, the Companies' DSM Advisory Group has also been utilized to understand the programs being proposed from a customer perspective. The DSM Advisory Group was formed in 2000 and provides an opportunity for representatives from each of the Companies' customer segments to discuss and provide feedback on the DSM / EE programs provided through the energy efficiency portfolio. Constituents who attend these meetings not only have an opportunity to discuss available and potential programming in a venue that supports

active two way communication, but are also provided educational opportunities in various areas of program cost effectiveness determination, DSM regulatory approval processes, and the Companies' efforts to coordinate programming with other organizations for maximized participation and customer benefit.

The Companies held a meeting with the Group in December 2012 to discuss the energy-efficiency market potential study and the efforts that were beginning to develop internally as it related to the current DSM / EE portfolio. The Group discussed the current programs that were scheduled to expire December 2014, forecasted program performance, which included energy, demand, and financials, and the regulatory approval process. Also, the Group solicited feedback on potential DSM programs for utility analysis and where additional energy savings could be garnered. The represented organizations in attendance included Metropolitan Housing Coalition, Louisville Metro Air Pollution Control District, Partnership for a Green City, Kentucky Housing Corporation, Department for Energy Development and Independence, Beyond Possibility, Mid-West Energy Efficiency Alliance, Shelby County Public Schools, and the Community Action Council. The completed sign-in sheet and meeting minutes from this meeting are in Appendix D.

The second scheduled meeting with the Group took place in June 2013 for additional feedback. The Group received information regarding historical program financial and energy/demand performance, additional information regarding expiring DSM/EE programming, scope of the energy efficiency potential study being conducted by The Cadmus Group, potential program modification opportunities, and the timing of future meetings. Constituency represented at the June 2013 meeting included Kentucky National Energy Education Development Project, Partnership for a Green City, Department for Energy Development and Independence, Jefferson County Public Schools, Kentucky School Board Association, Home Builders Association of Kentuckiana, Legal Aid Society of Louisville, University of Louisville, and the Louisville Metro Air Pollution Control District. The completed sign-in sheet and meeting minutes from this meeting are in Appendix E.

The third scheduled meeting with the Group took place in October 2013. The Group reviewed energy-efficiency programming history to date, preliminary results from the energy efficiency potential study conducted by The Cadmus Group, programs that are expiring from the portfolio at the end of 2014, and the Companies' DSM/EE plans for 2015-2018. The Constituency represented at the October 2013 meeting included Department for Energy Development and Independence, Community Action Council, Metropolitan Housing Coalition, Jefferson County Public Schools, Kentucky School Board Association, Home Builders Association of Kentuckiana, Legal Aid Society of Louisville, University of Louisville, and Louisville Metro Government. The completed sign-in sheet and meeting minutes from this meeting are in Appendix F.

The changes in federal legislation, historic and current portfolio performance, third-party validation from The Cadmus Group, and key stakeholder collaboration from the DSM Advisory Group are the underlying drivers of the proposed 2015-2018 DSM / EE Program Plan. Through the collaborative process a revised DSM/EE Program Plan has been developed that supports enhancements to current program offerings to meet the needs of changing energy-efficiency market conditions. The 2015-2018 DSM / EE Program Plan includes enhancements to the following programs:

- Commercial Load Management/ Demand Conservation Program – offers customizable demand response options to large commercial customers and educational entities while

targeting lighting, HVAC, and other equipment that can provide necessary demand savings. Customers must commit to a minimum reduction of 50 kW for each event, and incentives paid to customers are based on actual kW reduction during events.

- Residential Incentives Program – offers financial incentives to customers who purchase various ENERGY STAR[®] appliances, HVAC equipment or window films that meet certain requirements.
- Commercial Conservation Program / Commercial Incentive Program – offers commercial customers an understanding of their energy consumption, recommendations for energy efficiency improvements, and an incentive structure for commercial customers who choose to implement energy efficiency retrofits. In addition, incentives will be made available for new construction efforts where efficiency is above standard building code.
- Customer Education and Public Information – offers further education and outreach for the current residential and commercial segments through mass media outlets, face to face training opportunities for new home construction professionals, and “future customer” education efforts through school-based programming.
- Residential Conservation Program / Home Energy Performance Program – offers a residential audit and an opportunity to receive incentives based on energy savings through implemented energy efficiency retro fits recommended through the audit process. The program offering seeks to include a multi-family-property tier and an insulation and weatherization tier.
- Advanced Metering Systems (AMS) – offers customers who desire to have consumption data more frequently than once a month an opportunity to request and receive an advanced meter, which will present individual daily consumption through a website.

In addition to the programs listed above, there are programs that will remain within their current designs as approved in Case No. 2011-00134 through 2018. These programs include:

- Smart Energy Profile
- Residential Load Management / Demand Conservation Program
- Residential Refrigerator Removal Program
- Residential Low Income Weatherization Program (WeCare)
- Program Development and Administration

Program planning relies on assumptions about future market conditions, achievable potential and consumers’ behavior. As the programs continue to operate, the Companies will perform ongoing impact evaluation focusing on quantifying the energy and demand savings and other economic benefits of the DSM/EE portfolio. In addition, because the Study indicates that that the Companies will exhaust their energy efficiency potential rapidly at the Companies’ anticipated rate of energy and demand savings, the Companies are entering an uncertain future in which they will continue to monitor opportunities from both the marketplace perspective as well as the utility-cost perspective

and request approval for additional programming as it becomes economically viable to do so with new energy-efficiency technologies.

ES. 2 DSM / EE History

In 1992, Louisville Gas and Electric Company began a negotiation process with interveners regarding the implementation of DSM/EE programs for the benefit of its customers and the recovery of costs associated with such programs. The effort became known as the DSM Collaborative. The collaborative effort resulted in a request to the Commission in November 1993 to approve a plan for DSM/EE programming, a DSM Cost Recovery Mechanism, and to continue the collaborative process for LG&E.⁵ Initial DSM/EE programs were implemented in 1994.

The DSM Collaborative submitted a new filing in December 1995 proposing new DSM/EE programs and the continuation of the existing programs approved in Case No. 93-105. The Commission approved the filing in June 1996. The approval included initial research and development for the Residential Load Management Program. In addition, it included a Program Development and Administration program, which was developed to capture the cost of developing and administering the complete set of DSM/EE programs.

In 1997, the DSM Collaborative submitted several filings that resulted in all the programs previously approved being proposed again to the Commission along with the addition of the Residential Energy Audit Program. The Commission approved this filing in April 1998.

The Companies received approval for the modification and continuation of DSM/EE programs and cost recovery mechanisms in May 2001. In 2008, the Commission approved Case No. 2007-00319.⁶ That filing demonstrated the Companies' objective to develop, implement, and promote cost-effective offerings that advance the effective and deliberate use of energy by end-use customers.

In 2012, the Commission approved the Companies' latest DSM/EE program plan in Case No. 2011-00134. The approved programs included modifications to existing programs previously approved in Case No. 2007-00319 as well as some new programming. The new programming included a Smart Energy Profile Program, Residential Incentives Program, and Residential Refrigerator Removal Program. All of the approved programs further provided customers with tools and resources needed to help make better use of the energy the Companies provide.

Energy-efficiency initiatives are an important element of the overall corporate strategy to provide safe, reliable least cost energy to our customers by using these programs to delay the need for additional generation through demand and energy reductions. Additionally, consumers consider energy-efficiency programs and energy-efficiency information an integral part of excellent customer service according to JD Power and Associates survey data. Therefore, to further their energy-

⁵ *In the Matter of A Joint Application for the Approval of Demand-Side Management Programs, A DSM Cost Recovery Mechanism, and a Continuing Collaborative Process on DSM For Louisville Gas and Electric Company*, Case No 93-150. (Order September 1, 1993).

⁶ *In the Matter of the Application of Louisville Gas and Electric Company and Kentucky Utilities Company Demand-Side Management for the Review, Modification, and Continuation of Energy Efficiency Programs and DSM Cost Recovery Mechanisms*, Case No. 2007-00319, (Order March 31, 2008).

efficiency efforts, the Companies submit their 2015-2018 DSM/EE Program Plan for the residential and commercial customer segments

ES. 3 Demand Side Management Cost Recovery Mechanism (DSMCRM)

The proposed energy efficiency programs proposed in this filing will be operated as one group of programs available to residential and commercial customers of LG&E and KU. While the programs will appear to be unified from a customer's perspective, separate accounting will allow for the proper recovery of the DSMCRM components from each utility's individual customers within the appropriate rate classes. The LG&E and KU tariffs contain the separate cost recovery mechanisms.

The Demand-Side Management Balancing Adjustment (DBA) is used to reconcile the difference between what was actually billed and what should have been billed for approved energy efficiency programs.

ES. 4 Program Evaluation

The Companies recognize the value of having a continuous improvement model for programming and practice evaluation, measurement, and verification (EM&V) methods. Currently the Companies use an EM&V model that examines program design, delivery, impacts, and return on investment. The EM&V methodology ensures quality and effectiveness of the programs, optimal use of resources, and responsiveness to customers' needs.

The Companies will use their EM&V model to ensure that all of the programs contained in this filing remain prudent, i.e., they demonstrate continuous improvement, and remain a good use of customers' dollars. The Companies typically perform program evaluation in two phases: process evaluation and impact evaluation. Process evaluation is a systematic assessment of an energy efficiency program for the purposes of improving its design, delivery, and perceived quality and usefulness to customers. Impact evaluation focuses on quantifying the energy and demand savings and other economic benefits of the program. If the Companies' reviews revealed any program to be cost-ineffective or otherwise underperforming, the Companies would discontinue the program and notify the Commission by a letter or motion.

ES. 5 Program Benefit / Cost Calculations

The benefit/cost ratios performed according to the California Standard Practice Manual for each of the proposed program modification requests are provided below in ES.5.1. Each of the programs on the proposed portfolio passes the Participant Test and the Total Resource Cost Test. Some programs contained in the portfolio do not have a participant cost. These programs have been designated as "n/a" in the Participant Test category.

The benefit/cost calculations for the DSM/EE program plan were performed using DSMore, a PC-based software package developed by Integral Analytics, Inc. DSMore provides robust analytics surrounding weather and market conditions and a transparent platform to understand the underlying

calculations associated with the benefit/cost tests.⁷ The DSMore input summary reports for the programs are in Appendix B and the output reports are in Appendix C.

ES. 5.1 Benefit / Cost Ratios for California Standards Tests

The Companies believe that the set of four cost-benefit tests the Commission currently employs, i.e., the set contained in the California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects (“Manual”), represents the best collection of tests for determining the cost-effectiveness of potential DSM/EE programs.⁸ These tests and their Manual definitions are:

- **The Participant Test:** The Participant Test is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.⁹
- **The Ratepayer Impact Measurement Test:** The Ratepayer Impact Measure (RIM) test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation is less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.¹⁰
- **The Total Resource Cost Test:** The Total Resource Cost Test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants’ and the utility’s costs. This test represents the combination of the effects of a program on both the customers participating and those not participating in a program. In a sense, it is the summation of the benefit and cost terms in the Participant and the Ratepayer Impact Measure tests, where the revenue (bill) change and the incentive terms intuitively cancel (except for the differences in net and gross savings).¹¹
- **The Program Administrator Cost Test (or “Utility Cost Test”):** The Program Administrator Cost Test measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC [Total Resource Cost] benefits. Costs are defined more narrowly.¹²

The Commission has not expressed a preference for one test over another in the Companies’ proceedings, and has approved programs for the Companies that pass certain tests but do not pass others (“passing” is a value over 1.0). The Companies, however, have historically placed additional weight on the Total Resource Cost and Participant Tests. The Total Resource Cost Test is

⁷ Additional market condition analytics considered in this filing include but are not limited to: geographic boundary market power prices; and average electric / gas pricing within those geographic boundaries.

⁸ The Manual is available online at: http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF

⁹ Manual at 8.

¹⁰ Manual at 13.

¹¹ Manual at 18.

¹² Manual at 23.

particularly important because it is the most comprehensive indicator of whether a DSM/EE program will create net benefits for customers and the utilities. The Companies have also placed special emphasis on the Participant Test because of the voluntary nature of DSM/EE programs in Kentucky; if a DSM/EE program will not benefit its participants, it is unlikely to have many participants and would likely be a waste of resources. For these reasons, the Companies recommend that the Commission consider all four of the Manual’s tests, but that it place special emphasis on the Total Resource Cost and Participant Tests.

The Companies performed the four traditional DSM/EE cost-benefit tests for each of the programs in the Proposed DSM/EE Program Plan except the Advanced Metering Systems, which this document addresses in Section 7.0 below. For analysis purposes of this program plan, all programs, existing and enhanced, were assessed with an evaluated program period of four years, 2015-2018. The table below provides the individual program performance and the overall portfolio scores for the DSM/EE Program Plan. All of the proposed programs with enhancements have a Participant Test and Total Resource Cost Test a passing score valued above 1.0. Also, the Companies’ proposed DSM/EE portfolio except the Advanced Metering Systems, taken as a whole, passes the Participant, Utility Cost, and Total Resource Cost Tests. As demonstrated by the overall portfolio scores, the programs presented in this proposal will provide a benefit for customers and the Companies.

Program	DSMore Scoring			
	Participant Test	Utility Cost Test	Ratepayer Impact Test	Total Resource Cost Test
Residential Low Income Weatherization (WeCare)	N/A	2.57	0.60	2.57
Residential Load Management	N/A	1.47	1.02	2.95
Residential Refrigerator Removal	N/A	1.86	0.56	2.26
Smart Energy Profile	N/A	3.07	0.74	3.07
Program Development & Administration	N/A	0.00	0.00	0.00
Residential Conservation	6.50	2.52	0.68	1.93
Residential Incentives	3.20	4.53	0.81	2.37
Commercial Conservation	7.56	16.42	1.18	7.26
Commercial Load Management	N/A	1.64	0.86	2.27
Customer Education & Public Information	N/A	0.00	0.00	0.00
Overall Portfolio	8.66	3.13	0.86	3.07

ES. 6 Timeline

The anticipated implementation of this proposed plan will require the support of additional personnel within the Companies such as procurement, marketing, and communications. These areas will support necessary contract work, development of marketing, and communications plans, respectively. The Customer Energy Efficiency Department will work with these personnel to ensure that potential vendors and the marketing and communications strategy employed will encourage customers to participate in the enhanced programs.

To support the implementation timeline for the requested enhancements to programming in the portfolio, the Companies intend to move forward with the Request for Proposal process to seek

qualified contractors and consultants for the programs while this case is pending with the Commission. Successful bidders will enter into contracts with the Companies that are contingent upon Commission approval of the respective programs and corresponding cost recovery. The remaining unchanged programs in the portfolio will operate as previously approved through 2018. The Companies request that their revised tariffs take effect, and that their enhanced and new programs begin, on January 1, 2015.

ES. 7 Energy and Demand Reductions

To support the development of this application, the Companies consulted with The Cadmus Group, a third-party vendor, to ensure the validity of the proposed energy and demand reduction budgets. This consultation with The Cadmus Group provided a programmatic level consultation and was outside of the Potential Study conducted as a result of the Commission's final order in Case No. 2011-00375. The series of tables below illustrate the projected and cumulative annual energy and demand savings for the programs contained in this filing.

Incremental	Projected Energy & Demand Savings			
	2015	2016	2017	2018
MWh	196,115	196,678	199,165	200,261
MW	59	57	58	58
CCF	2,480,986	2,535,279	2,632,202	2,717,998

Cumulative	Projected Energy & Demand Savings				
	Portfolio Pre - 2015	2015	2016	2017	2018
MWh	832,709	1,028,824	1,225,502	1,424,667	1,624,929
MW	340	388	425	463	500
CCF	3,014,996	5,495,982	8,031,261	10,663,463	13,381,461

Case 2011-00134 Cumulative	Projected Energy & Demand Savings							
	Portfolio Pre - 2011	2012	2013	2014	2015	2016	2017	2018
MWh	206,482	380,693	365,951	562,890	806,659	1,006,871	1,208,179	1,410,584
MW	182	231	281	325	378	416	453	491
CCF	806,524	1,638,358	2,381,163	4,027,556	6,564,420	9,056,652	11,634,680	14,298,503

The demand reductions achieved by the current portfolio of DSM/EE programs through the end of 2012 is 231 MW. The proposed program modifications to the DSM/EE program portfolio will produce variances in energy and CCF when compared to the projected energy and demand savings of Case No. 2011-00134. The energy and CCF variances result from the proposed modifications to the Commercial Load Management / Demand Conservation Program (-460 MWh), Commercial Conservation (-46,616 MWh and an additional 219,646 CCF), and the Residential Incentives Program (+35,720 MWh). Upon completion of the proposed program plan, the DSM/EE Program Plan will produce more overall energy and demand savings for the Companies, bringing the total cumulative demand savings created by the Companies' DSM/EE portfolio to 500 MW by the end of 2018.

As the Smart Energy Profile Program savings have a useful life of one year, the demand reductions in the tables above are not added across years. The demand reductions achieved through 2018 place the Companies on target to meet their cumulative demand reduction in Case No. 2011-00134.

ES. 8 Program Budget

The Companies consulted with The Cadmus Group to support the development and validity of the operational budgets for the proposed programs. The following budget projections give an overview of the proposed budget by expense type, program, and rate class.

ES. 8.1 Annual Budget by Program

The amount approved by the Commission in Case No. 2011-00134 for years 2015-2018 is \$155M. The Companies are requesting an additional \$23.7M in this proposal, which will support program modifications to the Commercial Load Management Program / Demand Conservation Program, Residential Incentives Program, Commercial Conservation / Commercial Incentive Program, and Residential Conservation Program / Home Energy Performance Program. These funds will also support the continuation of their Commission-approved Case No. 2007-00319 Customer Education and Public Information Program through the end of 2018, as well as the implementation of an Advanced Metering Systems effort. The total 2015-2018 DSM/EE Portfolio annual budget is presented in the table below.

DSM / EE Program O&M (\$000's)	2015	2016	2017	2018	Total
Existing					
Smart Energy Profile	\$3,311	\$3,344	\$3,433	\$3,468	\$13,555
Residential Load Management	\$9,865	\$10,073	\$10,443	\$10,877	\$41,257
Residential Refrigerator Removal	\$2,037	\$2,068	\$2,150	\$2,211	\$8,466
Residential Low Income Weatherization (WeCare)	\$4,947	\$5,887	\$6,862	\$7,843	\$25,539
Program Development & Administration	\$1,373	\$1,421	\$1,471	\$1,522	\$5,788
Revised					
Commercial Load Management	\$946	\$1,252	\$1,564	\$1,882	\$5,643
Residential Incentives	\$4,108	\$4,086	\$4,094	\$4,133	\$16,422
Customer Education & Public Information	\$4,043	\$4,110	\$4,194	\$4,295	\$16,643
Residential Conservation	\$2,255	\$2,250	\$2,289	\$2,361	\$9,156
Commercial Conservation	\$3,339	\$3,369	\$3,400	\$3,431	\$13,538
Overall Portfolio O&M	\$36,223	\$37,861	\$39,899	\$42,023	\$156,006

DSM / EE Program Capital (\$000's)	2015	2016	2017	2018	Total
Existing					
Residential Load Management Capital	\$3,957	\$3,528	\$3,597	\$3,668	\$14,750
Revised					
Commercial Load Management Capital	\$631	\$644	\$657	\$670	\$2,601
Overall Portfolio Capital	\$4,588	\$4,172	\$4,254	\$4,338	\$17,351

	2015	2016	2017	2018	Total
TOTAL Portfolio Budget (\$000's)	\$40,811	\$42,033	\$44,153	\$46,360	\$173,358

Case 2011-00134 (\$000's)	2015	2016	2017	2018	Total
O&M Expenses	\$40,287	\$31,528	\$33,186	\$34,909	\$139,910
Capital Expenses	\$4,151	\$3,681	\$3,753	\$3,827	\$15,411
Total Budget	\$44,438	\$35,209	\$36,939	\$38,736	\$155,321

Difference (\$000's)	2015	2016	2017	2018	Total
O&M Expenses	(\$4,064)	\$6,334	\$6,713	\$7,114	\$16,097
Capital Expenses	\$437	\$491	\$501	\$511	\$1,941

Advanced Metering Systems	2015	2016	2017	2018	Total
O&M Expenses	\$442	\$549	\$556	\$333	\$1,879
Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830
Total Budget	\$825	\$1,698	\$1,705	\$1,482	\$5,709

**LG&E and KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

**.LG&E AND KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

1.0 Commercial Load Management / Demand Conservation

**LG&E AND KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

Program Name: Commercial Load Management / Demand Conservation

1.1 Program Overview

The Commercial Load Management / Demand Conservation Program is a voluntary program that supports the Companies by reducing peak demand when energy consumption is at its highest. In operation since 2001, the program utilizes one-way switches to cycle central air conditioning systems, heat pumps, electric water heaters, and/or pool pumps in small commercial properties.

Through the existing approved budget associated with their Commercial Load Management / Demand Conservation Program, the Companies launched a large commercial load management effort in 2012 to evaluate available control technologies and customer participation. The small-scale effort included eighteen (18) large commercial companies representing over eighty-four (84) sites across the service territory. The diversity of the sites participating includes, but is not limited to, retail, school, utility, local government, and distribution facilities. These enrolled sites have yielded nearly a 10MW demand reduction in the 2013 load control season. The large commercial program currently uses two-way switching devices to cycle customer equipment during load control events. Two-way devices provide real time visibility into a customers' energy consumption, which is monitored through web-based software.

With the demonstrated success of the large commercial technologies, the Companies seek to enhance the Commercial Load Management / Demand Conservation Program in two ways: (1) move the large commercial load management effort to a full commercial deployment; and (2) the ability to modify financial incentives to encourage customers to participate in this voluntary program.

1.2 Rationale for Request

In 2012, the Commercial Load Management / Demand Conservation Program launched a small-scale effort for large commercial customers who have energy systems that can support load management reductions through energy management systems. The demand reduction achieved through the small-scale effort has allowed the Companies to provide load management programming to the large commercial customer segment that has previously only been available to small commercial customers.

1.3 Program Audience

The program will be available to commercial customers with a demand of at least 200 kW and a minimum load reduction capability of 50 kW. Commercial customers participating in other demand curtailment tariffs are not eligible.

1.4 Program Benefits

The expansion of the Commercial Load Management / Demand Conservation Program to include large commercial customers will further allow the Companies to reduce electricity usage during peak times. Based on the participation and achievable demand reduction, the implementation of a full scale large commercial deployment would further support their efforts to delay further generating assets. In addition to the benefits to the Companies, customers who participate in this program will benefit from equipment installation and a web-based software application that provides real-time monitoring capabilities to educate on day-to-day energy use that can identify additional opportunities to use energy more efficiently.

1.5 Participation Goals

The small commercial program goals have been reduced to allow for increased focus on the large commercial program. The large commercial program is designed to add 5 MW of demand response per year for 2015-2018. The Companies will target an equal participation split between LG&E and KU. Commercial customer annual participation goals for both programs are 50 each.

1.5.1 Participation Goals

Annual Installations	2015	2016	2017	2018	Total
Small Commercial	50	50	50	50	200
Large Commercial	50	50	50	50	200
Total	100	100	100	100	400

Cumulative Installations	2015	2016	2017	2018
Small Commercial	50	100	150	200
Large Commercial	50	100	150	200
Total	100	200	300	400

1.6 Energy and Demand Impacts

The Commercial Load Management / Demand Conservation Program is able to reduce overall energy usage by targeting peak demand. Load is generally curtailed during the summer months by device cycling, as the Companies are traditionally summer peaking utilities.

1.6.1 Annual and Cumulative Energy Reductions

Annual Reductions		Existing*	2015	2016	2017	2018	Total
Energy	MWh	0	0	0	0	0	0
Demand	MW	10.0	5.1	5.1	5.1	5.1	30.3

Cumulative Reductions		Existing*	2015	2016	2017	2018
Energy	MWh	0	0	0	0	0
Demand	MW	10.0	15.1	20.2	25.2	30.3

* Existing demand saving attributed to program currently in operation and funded through the DSM mechanism.

1.7 Customer Incentives

In the most recently approved DSM/EE Program plan, the Companies received approval for increased autonomy to modify the incentive structure in their Residential Load Control / Demand Conservation Program. The Companies now seek the ability to implement a similar incentive structure with the Commercial Load / Demand Conservation Program. The Companies will begin at \$25 / kW reduction and will evaluate customer engagement and participation over time. Any adjustments to the rate per kW reduction provided to customers will be provided in the Companies' tariff sheets. Commercial customers participating in other demand curtailment tariffs are not eligible. The incentive that is provided will be based on the actual energy reductions achieved by the participant and the frequency of load control events. Incentives will be paid to program participants once the load control season is complete.

1.8 Implementation Plan

For the small commercial program, the proposal is to continue installing load control switches on small central air conditioners on an additional 200 commercial air conditioners during years one through four of the program plan. The large commercial program will expand beyond the existing program in similar fashion and provide an additional 5 MW of load reduction per year over the four-year program planning period.

1.9 Annual Program Budget

Annual program budgetary information for both the residential and commercial components of the Load Management Program is in the tables below. Projected program costs as presented in the 2011 DSM/EE filing have also been included below, as a means for comparison with the costs of the redesigned program. The Companies will use the existing capital component to account for the capital expenditure needed to further develop the Load Management Program.

1.9.1 Annual Program Budget

Program Costs

\$000s	2015	2016	2017	2018	Total
Administration	\$81	\$84	\$86	\$90	\$340
Implementation	\$1,124	\$1,287	\$1,457	\$1,632	\$5,500
Incentives	\$344	\$496	\$648	\$801	\$2,289
Miscellaneous	\$28	\$28	\$29	\$29	\$114
Total Program Expenses	\$1,577	\$1,895	\$2,220	\$2,552	\$8,244
Capital Expenditures	\$631	\$644	\$657	\$670	\$2,601
O&M Expenditures	\$946	\$1,252	\$1,564	\$1,882	\$5,643

Program Cost Comparison to 2011 DSM Filing

\$000s	2015	2016	2017	2018	Total
Program Redesign	\$1,577	\$1,895	\$2,220	\$2,552	\$8,244
Original Program	\$584	\$608	\$646	\$687	\$2,525
Difference	\$993	\$1,288	\$1,574	\$1,865	\$5,719

Program Budgetary Assumptions

- Program labor is unchanged at 0.4 Program Manager allocated to budget.

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2.0 Residential Incentives Program

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Program Name: Residential Incentives Program

2.1 Program Overview

The Residential Incentives Program was approved in the Companies' most recent DSM/EE Plan in Case No. 2011-00314. The goal of the program is to encourage the residential customer segment to purchase more efficient ENERGY STAR[®] appliances. Monetary rewards ranging from \$50 to \$300 are provided to help the Companies' residential electric customers offset the purchasing costs of certain ENERGY STAR[®] qualified appliances, high-efficiency HVAC systems, and qualified window film.

To participate, residential customers submit a completed rebate application along with appropriate documentation. Once a rebate application is approved, the customer is issued the applicable rebate check.

The Residential Incentives Program has experienced success since its inception due to its simple design and variety of appliances rebated. As such, through November 2013 the Companies have surpassed their anticipated rebated appliances by 125% and their forecasted financial spend by 107%. To address the exceedingly high customer participation and prevent early program termination, the Companies seek approval for increased incentive dollars available to customers to fund the program through 2018 consistent with the original filing for this program.

2.2 Rationale for Program Request

The Companies have experienced a higher than anticipated customer participation for the Residential Incentives Program. Through November 2013 the Companies have seen 32,466 rebates processed on an original forecast of 12,500. Based on program performance and support through the DSM Program Review conducted by The Cadmus Group, the Companies are requesting additional funds to support the continuation of this highly utilized program through its approved 2018 funding cycle. The Companies recognize that program participation may become more standardized as the program continues; however, to continue support for our current residential customer segment at its current rate the Companies request to increase the incentive dollars by 65% for 2015-2018 to mirror the historic 2012-2013 customer participation.

2.3 Program Audience

The program will be available to all residential customers. Customer eligibility will continue to be associated with the individual customer account.

2.4 Program Benefits

The program has supported the residential customer segment in reducing energy usage, thereby reducing participating customers' energy expenses. According to ENERGY STAR[®], the U.S. Environmental Protection Agency (EPA) estimates that homeowners can save up to 30 percent on energy bills with ENERGY STAR[®] appliances.¹ Additionally, by incorporating advanced technologies and premium features, ENERGY STAR[®] certified appliances help offset initial costs through energy savings over the life of the unit.² By the residential customer segment installing energy-efficiency measures further advancement is made towards energy/demand reduction goals.

2.5 Participation Goals

Participation goals for years one through four are designed to parallel with the annual total realized since the program was approved in Case 2011-00134.

2.5.1 Participation Goals

Annual Rebates	2015	2016	2017	2018	Total
LGE	17,550	17,550	17,550	17,550	70,200
KU	17,550	17,550	17,550	17,550	70,200
Total	35,100	35,100	35,100	35,100	140,400

	2015	2016	2017	2018	Total
Annual Rebates	35,100	35,100	35,100	35,100	140,400
Case 2011-00134	20,500	20,500	20,500	20,500	82,000
Difference	14,600	14,600	14,600	14,600	58,400

2.6 Energy and Demand Impacts

Energy and demand impacts for the Residential Incentives Program have been calculated through year four of the program plan. The cumulative energy and demand reductions by the end of year four will be 100,886 MWh and 15.2 MW. The Residential Incentives Program is expected to result in the annual and cumulative energy reductions described in the tables below.

¹ See http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialHomeImprovement.pdf?8a52-b9ad

² See

http://www.energystar.gov/ia/partners/publications/pubdocs/ENERGY%20STAR%20Appliances%20Brochure_508.pdf?f55d-12bb

2.6.1 Annual and Cumulative Energy Impacts

Annual Reductions		2015	2016	2017	2018	Total
Energy	MWh	25,221	25,221	25,221	25,221	100,884
Demand	MW	4.1	4.1	4.1	4.1	16

Cumulative Reductions		2015	2016	2017	2018
Energy	MWh	25,221	50,442	75,663	100,884
Demand	MW	4.1	8.2	12.2	16.3

Cumulative Reductions		2015	2016	2017	2018
Case 2011-00134		2015	2016	2017	2018
Energy	MWh	16,291	32,582	48,873	65,164
Demand	MW	3.0	6.0	9.0	12.0

2.7 Implementation Plan

The companies will continue to operate the incentive processing via a third party.

2.8 Annual Program Budget

Annual program budgetary information for Residential Incentives is in the table below.

2.8.1 Annual Program Budget

Program Costs

\$000s	2015	2016	2017	2018	Total
Administration	\$195	\$202	\$209	\$216	\$822
Implementation	\$895	\$895	\$895	\$895	\$3,578
Incentives	\$2,935	\$2,935	\$2,935	\$2,935	\$11,740
Miscellaneous	\$84	\$55	\$56	\$87	\$282
Total	\$4,108	\$4,086	\$4,094	\$4,133	\$16,422

Program Cost Comparison to 2011 DSM Filing

\$000s	2015	2016	2017	2018	Total
Program Redesign	\$4,108	\$4,086	\$4,094	\$4,133	\$16,422
Original Program	\$2,683	\$2,661	\$2,669	\$2,707	\$10,720
Difference	\$1,425	\$1,425	\$1,425	\$1,426	\$5,702

Program Budgetary Assumptions

- Labor cost assumes a 0.75 full-time equivalent Program Manager and a 0.75 full-time equivalent Customer Service Associate for internal needs.
- 50% / 50% split of program budget between LG&E and KU.
- Customer incentives categories will continue to be based on the Commission-approved Case No. 2011-00134 levels.
- Outside service / install assumes rebate processing fee and verification will be performed by a third party vendor.
- Costs are escalated to reflect inflation.

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3.0 Commercial Conservation / Commercial Incentives

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Program Name: Commercial Conservation / Commercial Incentives

3.1 Program Overview

The Commission approved the Commercial Conservation / Commercial Incentives Program in the Companies' most recent DSM/EE Plan in Case No. 2011-00314. As currently approved the Commercial Conservation / Commercial Incentives Program provides participating commercial customers a better understanding of their energy consumption through energy audits and recommendations on energy-efficiency improvements. The Companies' commercial customers have an opportunity to apply for financial incentives to assist with replacing aging and less-efficient equipment through either a prescriptive or a customized rebate.

This proposed filing enhancement is responsive to needs of the commercial customer segment. The Companies seek to enhance this program in several ways: (1) the Companies seek to eliminate the on-site commercial audits; (2) the Companies seek to further develop its online audit tool as well as additional special-purpose energy tools to support commercial customers; (3) the Companies seek to rebate for new construction efforts where efficiency is above standard building code; and (4) the Companies seek to reduce demand reduction and the associated rebate dollars.

3.2 Rationale for Program Request

Implementation of the on-site energy audit component of the Commercial Conservation / Commercial Incentives Program was to provide the commercial customer a better understanding of their energy consumption and provide recommendations on energy efficient improvements. The Companies' strategy was through offering commercial customers the opportunity to identify improvements that the commercial customer would take advantage of available incentives to help offset improvement costs. The Companies have only seen a 6.5% conversion rate between the amount of on-site energy audits completed and the number of incentives submitted by commercial customers. In addition, one of the findings in The Cadmus Group Study was the realization of fewer economic and achievable measures due the current market conditions and costs. As such, the Companies look to lower their prior approved annual commercial incentive amount from \$2.0M to \$1.5M. According to The Cadmus Group, although the relationship between avoided costs and economic potential is not perfectly linear, avoided energy and capacity costs are the key determinants of economic potential.

Though the Companies are asking to eliminate on-site commercial audits from the DSM/EE portfolio, they intend to rebate their commercial customers who have an onsite commercial audit independently who then implement recommended energy saving measures from the audit. In addition, the Companies look to provide an online tool for their Business Service Centers and commercial customer segment to attain recommendations for energy-efficient improvements. This effort will allow the Companies to provide energy-efficiency programming to these customers and

further support customer goals. Furthermore, encouraging new construction efforts to implement design options for efficient construction that is above building code will further increase energy savings.

3.3 Program Audience

This program will be available to commercial customers only. The incentives will be available to customers who are replacing less-efficient equipment with more efficient models.

3.4 Program Benefits

Through the Commercial Conservation / Commercial Incentives program, commercial property customers will receive incentives based on implemented measurable energy efficiency improvements. The installed energy efficiency measures will reduce energy use, thereby reducing commercial customer’s operating expenses. Through support of energy efficient new construction efforts the Companies can encourage energy-efficient buildings, further reducing the Companies’ generation requirements.

3.5 Participation Goals

The yearly participation goals for the Commercial Conservation / Commercial Incentive Program are determined through the verified incentives provided to customers.

3.6 Energy Impacts

The yearly energy impacts for the Commercial Conservation / Commercial Incentive Program are provided in the tables below.

3.6.1 Energy and Demand Impacts

Annual Reductions		2015	2016	2017	2018	Total
Energy	MWh	42,631	42,631	44,021	44,021	173,304
Demand	MW	15.73	15.73	15.95	15.95	63.37
Gas	CCF	(103,534)	(103,534)	(92,407)	(92,407)	(391,881)

Cumulative Reductions		2015	2016	2017	2018
Energy	MWh	42,631	85,262	129,283	173,304
Demand	MW	15.73	31.47	47.42	63.37
Gas	CCF	(103,534)	(207,068)	(299,475)	(391,881)

3.7 Customer Incentive

Customer incentives will be available to customers who install sustainable energy-efficient equipment. Incentives will continue to be available to all customers based upon a \$100 per kW for calculated efficiency improvements. In addition, customers who build new construction efforts above code will be eligible for incentives as well. Moreover, if the customer is installing sustainable energy efficient equipment that has been recommended as energy saving measures from an energy audit, the customer will also be eligible for an incentive to help offset the cost of the completed audit. Although the Companies have cancelled the onsite audit component of this program, if a customer performs an energy audit on their own accord that recommends energy efficiency measures, the Companies will rebate the customer for installed energy-efficiency measures recommended through their completed audit at the reimbursement level approved in Case No 2011-00134.

3.8 Implementation Plan

Program oversight is the Companies' responsibility. The major responsibilities are: promote the program within the LG&E and KU service territory; monitor quality assurance; ensure contractor payment; oversee the program database; and process customer applications. The Companies will make final decisions on the contractors, performance, and all program expenditures. Program oversight is provided through invoicing, retaining customer documentation of incentivized measure information, and an evaluation report prepared by the outside evaluation contractor.

3.9 Annual Program Budget

Annual program budgetary information for the Commercial Conservation/ Commercial Incentive Program is in the table below. Projected program costs as presented in the 2007 DSM filing have also been included below, as a means for comparison with the costs of the redesigned program.

3.9.1 Annual Program Budget

Program Costs					
\$000s	2015	2016	2017	2018	Total
Administration	238	246	255	264	1,003
Implementation	1,531	1,553	1,516	1,538	6,138
Incentives	1,559	1,559	1,618	1,618	6,354
Miscellaneous	11	11	11	11	44
	3,339	3,369	3,400	3,431	13,538

Program Cost Comparison to 2011 DSM Filing

\$000s	2015	2016	2017	2018	Total
Program Redesign	\$3,339	\$3,369	\$3,400	\$3,431	\$13,538
2011 Filed Program	\$3,339	\$3,369	\$3,400	\$3,431	\$13,538
Difference	\$0	\$0	\$0	\$0	\$0

Program Budgetary Assumptions

- Offer new construction incentives to see if they gain any traction with commercial customers.
- Online tools are offered but will claim no savings.
- Incentives are based on the Companies' avoided capacity cost just as the original program was designed.

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4.0 Customer Education and Public Information

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Program Name: Customer Education and Public Information

4.1 Program Overview

The Customer Education and Public Information Program was approved in the Companies' DSM/EE Plan in Case No. 2007-00319, which granted approval through 2014. Education and Public Information was fully executed in 2009 with a successful marketing campaign and school based education program. The program was implemented to increase public awareness and understanding of both the urgent need for more efficient use of energy and the environmental and financial impacts created by climate change issues, the Education and Public Information Program has been widespread throughout the Companies' service territories.

To address the continued need for education and increase public awareness and understanding of both the urgent need for more efficient use of energy and the financial impacts created by increased usage the Companies are seeking continuation in the following aspects: (1) adding funds that will allow for further outreach to the current residential and commercial segments through mass media outlets and "future customer" education efforts through school based programming; (2) adding training opportunities for home construction professionals; and (3) extending the Customer Education and Public Information Program through the four-year proposed program plan.

4.2 Rationale for Program Request

Programming through the Customer Education and Public Information Program is designed to increase customer awareness and encourage utilization of energy-efficiency products and services. Current and potential future consumers will learn and understand the cost advantages of addressing electric system load growth by embracing energy efficiency and demand-response programs relative to the higher costs associated with adding generating assets and/or environmental compliance. Efforts will inform consumers that energy-efficiency initiatives can provide opportunities for them to maintain their comfort and level of service while reducing energy consumption. Through each effort supported by the experience provided by the Customer Education and Public Information Program, customers will gain an increased understanding that participation in developed energy efficiency programs costs less than construction of new power plants and has less impact on utility rates and the environment.

Through the years guiding principles for teaching and learning have developed. The fundamental principles include: (1) people are born investigators and learners; (2) effective learning focuses on a core set of ideas and practices; (3) understanding develops over time; (4) requires both knowledge and practice; (5) connection to interests and experience enhances learning; and (6) education

opportunities must be equitable and accessible to all.³ Evidence of the importance of consumer information and education is provided by Paul Stern, Director of the Committee on the Human Dimensions of Global Change at the U.S. National Research Council and President of the Social and Environmental Research Institute (SERI). Stern states that education addresses barriers to the individual consumer and that the impact of education is at its greatest when combined with other interventions.⁴ Supported by this available research, a highly plausible outcome of the Customer Education and Public Information Program will be that through a targeted, multi-faceted educational process the level of customer knowledge of energy and energy-related concepts will be heightened, making the consumer a better decision-maker on his/her individual energy consumption.

4.3 Program Audience

The audience for this program will include both the Companies' residential and commercial customer segments.

4.4 Program Benefits

The benefits of the Customer Education and Public Information Program is an educated residential and commercial customer segment that understands both the urgent need for more efficient use of energy and that participation in developed energy efficiency programs costs less than construction of new power plants and has less impact on utility rates. Since the Companies began energy-efficiency programming in 2008 they have worked with their outside advertising agency to maximize their media efforts. To this end, through the relationship the Companies have with their advertising agency business partner, the Companies have received \$2M of additional energy efficiency media efforts at no additional cost to the Companies or their customers. The additional media thus far includes bonus spots, coverage or rotations, interviews, sponsorships, audio/visual billboards, or reduced media rates, all of which provide additional impressions of available energy-efficiency programming to their residential and commercial customer segments.

4.5 Energy and Demand Impacts

There are no energy and demand impacts directly associated with this program. The benefits captured through customer enrollments in the other programs contained within the DSM/EE portfolio.

4.6 Customer Incentives

There are no financial incentives associated with this program.

³ U.S. Department of Energy. Energy Literacy, Essential Principles and Fundamental Concepts for Energy Education. A Framework for Energy Education for Learners of All Ages. Washington, DC, 2012. <<http://globalchange.gov/resources/educators/energy-literacy-framework>>.

⁴ Stern, Paul C. (2007). *Changing Behavior in Households and Communities through Education and Information: Critical Insights*. Committee on the Human Dimensions of Global Change National Research Council. Sacramento, CA.

4.7 Implementation Plan

The Customer Education and Public Information Program will be deployed in three separate channels: a school based program for K-8 students, mass media efforts, and face to face training for new home construction professionals. The implementation of training for new home construction professionals is a proposed new component to the Customer Education and Public Information Program. Originally contained within the expiring Residential New Construction Program, the Companies see value in continuing this trade-ally component as a means to educate construction professionals about new building codes, standards and energy efficient construction practices to continue support high performance residential construction. All program component oversight is the responsibilities of the Companies. The Companies will look to work in a coordinated effort with third party vendors to facilitate programming through various instructional methods to meet both the “future customer” and current customer’s educational needs.

4.8 Annual Program Budget

The four year program budget for the Customer Information and Public Information Program is provided in the table below.

4.8.1 Annual Program Budget

Program Costs					
\$000s	2015	2016	2017	2018	Total
Administration	\$171	\$176	\$182	\$187	\$716
Mass Media	\$3,323	\$3,390	\$3,458	\$3,527	\$13,698
School-based Programs	\$500	\$510	\$520	\$531	\$2,061
New Home Construction Education	\$30	\$31	\$31	\$32	\$124
Miscellaneous	\$18	\$4	\$4	\$19	\$44
Total	\$4,043	\$4,110	\$4,194	\$4,295	\$16,643

Program Budgetary Assumptions

- Program labor assumes one full-time Program Manager.
- Costs are escalated to reflect inflation.

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5.0 Residential Conservation / Home Energy Performance

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Program Name: Residential Conservation / Home Energy Performance

5.1 Program Overview

The Commission approved the Residential Conservation / Home Energy Performance Program in the Companies' most recent DSM/EE Plan in Case No. 2011-00314. As currently approved, the Residential Conservation Program provides an on-site energy audit by a certified energy analyst who will assess the home's efficiency and provide a report with energy saving improvement recommendations. Residential customers who achieve up to a 30% more efficiency in the home through implementation of energy saving improvements will be eligible for up to \$1,000 in incentives to offset measure installation costs. The Companies seek to enhance this program by: (1) implementing a tier structure for multi-family properties; and (2) the Companies seek to add a tier structure for insulation and weatherization efforts. There will be no additional dollars requested or energy / demand reductions from the requested enhancements. The requested enhancements will operate under the approved budgets in Case No. 2011-00134.

5.2 Rationale for Request

The program as proposed will allow a multi-family property incentive tier in the Residential Conservation / Home Energy Performance Program. The addition of a multi-family property incentive tier structure will build upon the existing Residential Conservation / Home Energy Performance Program to capture energy saving measures in a multi-family environment as identified by The Cadmus Group during the Program Review effort. The proposed insulation and weatherization tier is for the homeowner who has had insulation and weatherization measures identified within the completed on-site audit report.

5.3 Program Audience

The program will be open to all residential customers in the Companies service territories.

5.4 Program Benefits

This enhanced program structure will encourage additional customer retrofit implementation within the multi-family property community.

5.5 Participation Goals

The yearly participation goals for the Residential Conservation / Home Energy Performance Program are provided in the table below. The participation goals are the same as they are as approved in Case No. 2011-00134.

5.5.1 Online and Onsite Participation Goals

Participants - Online	2015	2016	2017	2018	Total
LG&E	3,000	3,000	3,000	3,000	12,000
KU	3,000	3,000	3,000	3,000	12,000
Total	6,000	6,000	6,000	6,000	24,000

Participants - Onsite	2015	2016	2017	2018	Total
LG&E	1,000	1,000	1,000	1,000	4,000
KU	1,000	1,000	1,000	1,000	4,000
Total	2,000	2,000	2,000	2,000	8,000

5.6 Energy and Demand Impacts

The yearly energy and demand impacts for the Residential Conservation / Home Energy Performance Program are provided in the table below. The anticipated impacts are the same as they are when approved in Case No. 2011-00134.

5.6.1 Annual and Cumulative Energy Impacts

Annual Reductions		2015	2016	2017	2018	Total
Energy	MWh	5,165	5,165	5,165	5,165	20,658
Demand	MW	1.3	1.3	1.3	1.3	5.3
Gas	CCF	165,031	165,031	165,031	165,031	660,122

Cumulative Reductions		2015	2016	2017	2018
Energy	MWh	5,165	10,329	15,494	20,658
Demand	MW	1.3	2.6	3.9	5.3
Gas	CCF	165,031	330,061	495,092	660,122

5.7 Customer Incentives

A comprehensive package of incentives is proposed to motivate customers to participate in the Residential Conservation / Home Energy Performance Program. For each of the tiers, multi-family properties are eligible, with a 50% reduction in the incentive. The 50% reduction is appropriate for multi-family residences because they have shared building envelopes that allow for shared savings not available to typical single family residences.

- On-Site Audit
 - On-Site Audit: Comparable to the existing Onsite Audit
 - Customers will pay a fee of \$25 to encourage customers to keep scheduled appointments.
 - Customers will receive installations to reduce energy usage by a targeted 10%.
- On-Site Audit Incentive Levels⁵
 - Tier One Audit Incentive
 - Customers will receive up to \$300 incentive upon completion of additional audit report recommended insulation and weatherization measures. The Companies anticipate an average customer expense of \$900 to implement the average set of recommended measures.
 - Multi-Family properties are eligible for incentive of \$150 per unit.
 - Tier Two Audit Incentive
 - Customers will receive up to a \$500 incentive upon completion of an additional 10% worth of verified energy savings following a test out. The Companies anticipate an additional average customer expense of \$1,500 to achieve the required energy savings.
 - Multi-Family properties are eligible for incentive of \$250 per unit.⁶
 - Tier Three Audit Incentive
 - Customers will receive up to a \$1000 incentive upon completion of an additional 20% worth of verified energy savings following a test out. The Companies anticipate an additional average customer expense of \$3,500 to achieve the required energy savings.
 - Multi-Family properties are eligible for incentive of \$500 per unit.

5.8 Implementation Plan

A vendor will be utilized to manage the audit and incentive process. The selected vendor will also log and manage “test-out” savings data of those residential customers who engage in the Tier Two or a Tier Three audit.

5.9 Annual Program Budget

The yearly program budgetary information for the Residential Conservation Program is in the table below.

⁵ All requested incentives for installed measures must have supporting documentation. Support documentation includes but is not limited to proof of purchase documentation.

⁶ “Test out” is the follow-up evaluation, measurement, and verification process completed with a customer to validate that the recommended energy efficiency measures have been installed correctly to ensure that the customer will receive the targeted energy reduction discussed during the initial on-site audit on an ongoing basis.

5.9.1 Annual Program Budget

The annual program budget associated with the Residential Conservation Program / Home Energy Performance are unchanged from the 2011 filing.

Program Costs					
\$000s	2015	2016	2017	2018	Total
Administration	\$665	\$637	\$652	\$700	\$2,654
Implementation	\$1,290	\$1,313	\$1,337	\$1,361	\$5,302
Incentives	\$300	\$300	\$300	\$300	\$1,200
Miscellaneous	-	-	-	-	-
Total	\$2,255	\$2,250	\$2,289	\$2,361	\$9,156

Program Budgetary Assumptions

- Tariff change will reflect the additional tier structures.
- Budgets will remain the same as approved in Case No. 2001-00134.

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6.0 Existing and Unchanged Programs: Smart Energy Profile Program, Residential Load Management / Demand Conservation, Residential Refrigerator Removal Program, Residential Low Income Weatherization Program (WeCare) and Program Development and Administration

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Program Name: Existing and Unchanged Programs to the DSM Portfolio

6.1 Overview

Several of the programs approved by the Kentucky Public Service Commission in the 2011 filing (Case No. 2011-00134) will remain unchanged and will continue at their currently approved funding levels and duration (through 2018). Those programs include: Smart Energy Profile Program, Residential Load Management, Residential Refrigerator Removal Program, Residential Low Income Weatherization Program (WeCare), and Program Development and Administration. Through ongoing and comprehensive analysis, the Companies will determine whether to pursue these programs further in a later DSM expansion filing or discontinue the programs in 2018. A brief overview and update on the current progress of each program is provided below.

Smart Energy Profile: The Smart Energy Profile Program serves as a vehicle for delivering energy and cost saving information to residential customers. Through a contracted vendor, customer usage and fuel type data is coupled with third-party customer data (i.e. home type and square footage) to create “peer groups” amongst the customer base. Select customers receive bi-monthly reports in the mail that describe how their energy usage compares to others in their “peer group,” along with personalized tips and advice for reducing their energy use. This normative messaging style, a product of Applied Behavioral Science, engages and motivates consumers to take action to make better energy-use decisions. As a result of this program, the Companies have experienced an energy reduction of 37,673 MWh and a demand reduction of 13.4 MW through November 2013. Program performance to date indicates that no program change is necessary at this time.

Residential Load Management / Demand Conservation: The Residential Load Management / Demand Conservation Program employs switches in homes and small businesses to help reduce the demand for electricity during peak times. The program uses technology to communicate with the switches to cycle central air conditioning units, heat pumps, electric water heaters, and pool pumps. As a result of this program, the Companies have experienced a demand reduction of 160 MW through November 2013. Program performance to date indicates that no program change is necessary at this time.

Residential Refrigerator Removal Program: The Residential Refrigerator Removal Program provides removal and recycling of inefficient secondary refrigerators and freezers to reduce consumption and demand. As a result of this program, the Companies have recycled 12,158 refrigerators and freezer units resulting in an energy reduction of 9,119 MWh and a demand reduction of 1.03 MW through November 2013. Program performance to date indicates that no program change is necessary at this time.

Residential Low Income Weatherization Program (WeCare): The Residential Low Income Weatherization Program (WeCare) Program provides residential customers who meet the Low Income Home Energy Assistance Program (LIHEAP) income guidelines measures or equivalent income guidelines help better manage their energy usage and improve the comfort and safety of their homes. The program offers an on-site home energy analysis, educational materials, home weatherization services, and installation of energy conservation measures. As a result of this program, the Companies have experienced an energy reduction of 25,317 MWh and a demand reduction of 1.5 MW through November 2013. Program performance to date indicates that no program change is necessary at this time.

Program Development and Administration: The Companies established Program Development and Administration to capture costs incurred in the development and administration of energy-efficiency programs where it is difficult to assign costs specifically to an individual program. The function of Program Development and Administration includes, but is not limited to, new program concept and initial design; market research related to new programming; research and technical evaluation of new technologies and programs, overall program tracking and management, development of key personnel, and membership in associated trade organizations. This program is functioning as designed; no program change is necessary at this time.

**LG&E AND KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

7.0 Advanced Metering Systems

**LG&E AND KU
2015-2018 DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAM PLAN**

Program Name: Advanced Metering Systems

7.1 Customer Service Offering

The goal is to provide customers who desire to have consumption data more frequently than once a month an opportunity to request and receive an advanced meter, which will present individual daily consumption through a website.

The offering is limited to 5,000 LG&E and 5,000 KU RS and GS customers on a first-come-first-serve basis.

Advanced meters would be installed for customers who elect to participate. A participating customer's consumption would be captured, communicated, and stored. Customers would be able to monitor their hourly usage through the web within two business days. The program does not include in-home devices.

Costs included in this filing are for network infrastructure, computer systems to control the network, meters, meter data management systems, operation of the network operation center, field maintenance, hardware and software maintenance, and other hardware and software that would be used to serve all advanced meters, inclusive of the ongoing expenses of a web-portal to display consumption data to customers.

The Companies followed the following criteria when designing the Advanced Metering Systems:

1. No lost sales from demand or energy have been included for Advanced Metering Systems in this filing because energy savings are unclear at this time, but the Companies may include lost sales in future DSM cases as the Companies gain more experience and data from Advanced Metering Systems.
2. The Companies did not calculate TRC or other California benefit-cost metrics for Advanced Metering Systems, and did not include the expense of this program in the California benefit-cost metrics for the Companies' proposed DSM-EE portfolio because the benefits from these meters are uncertain.
3. The DSM capital return has been included for all advanced meters and associated equipment, as it will remain useful over a period of years.
4. The service offering is designed for ongoing operations without a termination date.
5. The number of participants has been limited to limit initial cost. The Companies will consider expanding the offering if customer demand exceeds the initial caps.

7.2 Rationale for Optional Service Offering

The Companies have been engaged with the Kentucky Public Service Commission and various stakeholders since 2007 in considering the potential benefits and costs of Advanced Metering

Infrastructure (AMI) or smart-meter deployment and related service offerings. LG&E conducted a Responsive Pricing Program and Smart Meter Pilot from 2008-2011 to test certain smart meters and pricing alternatives in a geographically targeted area. The study tested the functionality of equipment available at that time and provided findings regarding customer engagement with rate and enabling technology options. The findings were presented to the Commission in a final report in July 2011. Subsequently, LG&E requested cancellation of the program, citing equipment obsolescence, vendor providing hosting service termination, and increasing costs for a decreasing number of participants. In approving the cancellation, the Commission's Order encouraged ongoing study into the efficacy and potential costs and benefits of further smart-meter deployment and dynamic pricing.

The pilot was designed primarily to gain experience in the functionality of the AMI equipment in selected geographies in close proximity to LG&E and KU headquarters in Louisville. While the pilot provided valuable initial feedback as to potential customer engagement issues, the results provide limited value for predicting the overall potential for customer response, which segments within the population might be expected to engage, and at what levels and for what purposes.

The pilot attempted to test two sets of outcomes: operational functionality of the equipment and customer responsiveness. The operational results were quite favorable for the performance of the electric meters, with approximately 99% reporting energy usage on a regular basis according to the April 2011 report. At the same time, LG&E noted the rapid emergence of new metering technologies in the marketplace over the period of the pilot as requiring additional study. Insights were also gained regarding related equipment requirements in rural areas, and the relative cost effectiveness of such investments.

The average monthly bill for all LG&E and KU residential customers combined is approximately \$104.75. The pilot group, located in an urban/suburban area, showed an average for the summer months of \$129.02 per month (\$516.08 divided by 4 months) according to the April 2011 report. Among this higher bill paying group, the savings realized were 1.4% of the bill. Overall, this pilot group demonstrated approximately a 1 kW maximum reduction in peak demand.

Investing in Advanced Metering Systems now is more economical than in the past due to the decline in advanced-meter costs in recent years. The *Smart Meter Study* conducted by DNV KEMA for the Companies (attached to the testimony of David E. Huff as Exhibit DEH-1) suggests that these costs have now decreased sufficiently to consider targeted advanced-meter deployment.¹ While full deployment remains overall uneconomical, the costs indicate that the Companies should again start to explore this technology through voluntary customer participation for a limited number of their customers.

7.3 Service Offering Audience

Up to 5,000 LG&E and 5,000 KU RS and GS customers will receive an advanced meter on a voluntary first-come-first-serve basis.

¹ *Smart Meter Study* at 55.

7.4 Program Benefits

The benefits are unknown; they will depend on what customers do with the enhanced consumption information from advanced meters and the associated web portal.

7.5 Participation Goals

Two factors caused the Companies to choose a 10,000 advanced-meter cap for the program. First, the *Smart Meter Study* indicates that opt-in rates for advanced meters range from 5 percent to 28 percent nationwide, with an average acceptance for opt-in programs of 11 percent.² A 1% participation rate is therefore a reasonable and conservative expectation; 10,000 customers are roughly 1% of the Companies' over 900,000 electric customers. Second, a 10,000-customer sample is large enough to provide the Companies a direct indication of customer desire for advanced meters while reasonably limiting the Companies' and their customers' investment at this time.

In addition to gaining information about the overall level of customer interest in advanced metering, deploying up to 5,000 advanced meters in each of the Companies' service territories will provide data on the geographic dispersion or concentration of customer adoption of advanced meter capabilities. This information will be valuable in estimating costs for a broader opt-in deployment of advanced metering systems.

The yearly participation goals for the Advanced Metering Systems are provided in the tables below based upon assuming full subscription.

RS and GS Customers	2015	2016	2017	2018	Total
LGE	500	1,500	1,500	1,500	5,000
KU	500	1,500	1,500	1,500	5,000
Total	1,000	3,000	3,000	3,000	10,000

7.6 Energy Impacts

The program energy and demand impacts are undetermined at this time as energy and demand reductions, if any, would be determined from how many customers participate and how much demand and energy savings they sustainably achieve.

7.7 Customer Incentive

This customer service offering does not include customer incentives to have an advanced meter (e.g., a bill credit for having an advanced meter installed) beyond the benefit of more granular usage data provided through a website.

² *Smart Meter Study* at 34.

7.8 Implementation Plan

Beginning January 1, 2015, the Companies will proceed with installing equipment and systems to collect and present customer consumption. The Companies will educate customers and install advanced meters for customers who request one.

7.9 Annual Program Budget

Note that, although budgetary estimates are provided below, the program costs incurred will directly relate to customer participation.

Program Capital Costs

\$000s	2015	2016	2017	2018	Total
Capital, Equipment, Systems	\$383	\$1,149	\$1,149	\$1,149	\$3,830
Total Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830

Program O&M Costs

\$000s	2015	2016	2017	2018	Total
Equipment & Systems	\$50	\$150	\$150	\$150	\$500
Labor	\$162	\$169	\$176	\$183	\$690
Customer Education	\$230	\$230	\$230	\$0	\$689
Total O&M Expenses	\$442	\$549	\$556	\$333	\$1,879

Total Program Budget

\$000s	2015	2016	2017	2018	Total
Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830
O&M Expenses	\$442	\$549	\$556	\$333	\$1,879
Total	\$825	\$1,698	\$1,705	\$1,482	\$5,709

**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

**2008-2014 Expiring
Demand-Side Management and
Energy Efficiency Programs**

Appendix A

LG&E AND KU 2008-2014 EXPIRING DEMAND-SIDE MANAGEMENT AND ENERGY EFFICIENCY PROGRAMS

Program Name: Residential High Efficiency Lighting

The Companies intend to allow the Residential High Efficiency Lighting Program to expire at the end of the approved 2014 budget cycle. The Residential High Efficiency Lighting program promotes an increased use of ENERGY STAR[®] rated CFLs within the residential sector of LG&E and KU electric consumers. LG&E and KU have used this program to increase customer awareness of environmental and financial benefits of CFLs and, as a result, to increase societal acceptance and gain market penetration.

In accordance with the Commission's order Case No. 2007-00319 and at the suggestion of the Attorney General's Office, LG&E and KU evaluated a direct mail and coupon program to determine the best method for increasing customer awareness and use of CFLs. The strategy for evaluation of these two methodologies was to alternate between a manufacturer's coupon and direct mail campaign on a quarterly basis through the year to increase customer acceptance of CFLs. The direct mail campaigns have proven to be the most economical from financial and operational perspectives because it allows the Companies to directly provide more efficient lighting in the residential customer segment. To support customer utilization of the Residential High Efficiency Lighting Program, the Companies attained approved energy and demand reductions exclusively through direct mail campaigns.³ Since the inception of the High Efficiency Lighting Program, the Companies have sent 5.8 million CFLs to residential electric customers, grown customer participation in the program from 27% to 50%, and effectively supported market transformation in lighting for residential customers.

Lighting has been cited by utilities in residential program surveys as one of the most successful programs for much of the past decade, both in customer participation and energy savings. That said, since the initial approval of the High Efficiency Lighting Program, the Energy Independence and Security Act of 2007 (EISA) was signed into law with the intention of moving the United States toward greater energy security, partly by increasing the standards for product efficiency. Section 321 of EISA, Efficient Light Bulbs, established higher minimum efficiency levels for medium screw base bulbs that began to take effect on January 1, 2012. The passage of EISA has provoked considerable conversations on the legislation's impact on lighting programs. With EISA requirements projected to lower energy usage from lighting by 28%, the amount of savings utilities can claim from lighting programs likely will decrease as a new baseline is set by the EISA standard.⁴ In addition to the legislative impacts to the High Efficiency Residential Lighting Program, according

³ The average customer participation rate of a CFL coupon campaign is ~ 1.5% resulting in immaterial energy and demand savings. The direct mail campaign has escalated to a participation rate of 50%, this coupled with the implementation of a customer "opt-in" feature for future CFL campaigns provides certainty for program development and execution to achieve the required energy and demand reductions for the Residential High Efficiency Lighting Program.

⁴ Customer Programs Service: Lighting Trends 2011, Stacey Bailey, Chartwell Inc.(October, 2011)

to the current state of the CFL market as discussed at the 2010 Energy Star Partner Meeting, Peter Banwell from the U.S. Environmental Protection Agency (EPA) noted that 90% of consumers are now aware of CFLs and 70% of U.S. households now contain at least one.⁵ Looking beyond CFL technologies, the Companies have assessed LED technologies for future programming. Although LEDs offer benefits over CFL bulbs, the high cost of LED technology remains a significant barrier to both market adoption and cost-effectiveness making LEDs uneconomical from a program perspective at this time.⁶

Because the Companies have achieved the original objective of the Residential High Efficiency Lighting Program through multiple CFL campaign efforts, and due to the uncertainty of the future of utility lighting portfolios as a result of the EISA legislation, as well as the cost prohibitive nature of residential LED technologies, there is no longer a need to continue to fund this project beyond the approved 2014 budget cycle.

Program Performance

The table below demonstrates projected program performance through November 2013 in relation to the 2007 filing budget.

Residential High Efficiency Lighting Program

	CFLs				
	TRC Score	Distributed	Energy (GWh)	Demand (MW)	Financials (\$000)
2007 Filing Budget	2.87	5.8M	342	23.1	\$24,117
Actuals through November 2013	3.37	5.1M	300	22.3	\$17,289
Variance		0.7M	(42)	-0.8	(\$6,828)

⁵ “Lighting Portfolio Planning for Efficiency Programs: Introductory Session,” Peter Banwell, U.S. Environmental Protection Agency, Energy Star Partner Meeting presentation (2010).

⁶ The current price of LEDs in the marketplace has incorporated the energy and demand savings each bulb will produce. At the time of this application, the lowest LED product in the marketplace sold for \$10.00 per bulb. As LED technology and lighting markets mature, the Companies will continue to assess for future program opportunities.

LG&E AND KU
2008-2014 EXPIRING DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAMS

Program Name: Residential New Construction Program

The Companies intend to allow the Residential New Construction Program to expire at the end of the approved 2014 budget cycle. The Residential New Construction Program is a Leadership in Housing Award and ENERGY STAR[®] award-winning program that was designed to reduce residential energy usage and facilitate market transformation by creating a shift in builders' new home construction to include energy-efficient construction practices. Builders who are part of the program can take advantage of technical training classes, gain additional exposure to potential customers, and receive incentives to help offset costs when including more energy-efficient features during home construction.

The program has been successful every year, winning awards such as the 2010 RESNET Infrastructure Development award, ENERGY STAR Partner of the Year Award in 2011 and 2012, and the ENERGY STAR Partner of the Year Award for Sustained Excellence in 2013, and has had a significant impact on the quality of new homes being built in the Company's territory since its inception. The partnerships between raters and builders drive the program's success; the program has grown to include more than 300 builders who have taken the training, of which 80 to 100 are active each year, and approximately 24 to 28 HERS raters.

Since the 2007 DSM Filing approval, the New Residential Construction Program has effectively spurred the marketplace encouraging the home builder community to build ENERGY STAR[®] certified homes. This program has been instrumental in increasing the number of Home Energy Rating System (HERS) raters that are required to inspect and certify homes within the Companies' service territory.

In January 2011, extensive changes in requirements for homes to earn the ENERGY STAR[®] label were set forth by the U.S. Environmental Protective Agency (EPA). Compared to past ENERGY STAR[®] guidelines, which were the foundation of the Commission-approved New Residential Construction Program,⁷ the new requirements will make these homes at least 15% more energy efficient than homes built to the 2004 International Residential Code (IRC), and include additional energy-saving features that typically make them 20–30% more efficient than standard homes.⁸

Homes will achieve this level of performance through a combination of energy-efficient improvements which include:

⁷ Builders who were already participating in the program completed extensive training on the ENERGY STAR[®] Version 3 requirements. New builders completed orientation training sessions designed to introduce them to the program, review its technical requirements, understand the benefits and support offered by LG&E and KU, and get them started on the process of engaging a home energy rater and registering individual homes.

⁸ See <http://www.energystar.gov>

- Effective Insulation Systems
- Tight Construction and Ducts
- ENERGY STAR[®] Qualified Lighting and Appliances
- High-Performance Windows
- Efficient Heating and Cooling Equipment

To ensure that a home meets ENERGY STAR[®] guidelines, third-party verification by a certified Home Energy Rater (or equivalent) is required. This Rater works closely with the builder throughout the construction process to help determine the needed energy-saving equipment and construction techniques and conduct required on-site diagnostic testing and inspections to document that the home is eligible to earn the ENERGY STAR[®] label.

The original objective of the New Residential Construction Program has been achieved through robust outreach efforts through involvement with local and state Home Builder Associations, the Midwest Regional ENERGY STAR[®] Conference, government housing regulators and funders, the affordable housing sector, and the residential construction community. Due to the achieved program impact coupled with the increased requirements for homes to earn the ENERGY STAR[®] label set forth by the U.S. Environmental Protective Agency (EPA), there is no longer a need to continue to fund this project beyond the approved 2014 budget cycle.

Although the Companies do not seek to continue the New Residential Construction Program in its current form, the Companies see value in continuing the technical training classes for the home building community. To that end, the Companies propose to provide technical training classes through their Customer Education and Public Information program. The full rationale, cost, and benefits are located in Section 9.0 of this document.

Program Performance

The table below demonstrates projected program performance through November 2013 in relation to the 2007 filing budget.

New Residential Construction Program

	Homes				
	TRC Score	Completed	Energy (GWh)	Demand (MW)	Financials (\$000)
2007 Filing Budget	1.09	4,487	12	3.8	\$7,778
Actuals through November 2013	2.78	4,470	17	6.3	\$5,725
Variance		(17)	5	2.5	(\$2,053)

**LG&E AND KU
2008-2014 EXPIRING DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAMS**

Program Name: Residential and Commercial HVAC Diagnostic and Tune-Up

The Companies intend to allow the Residential and Commercial HVAC Diagnostic and Tune-Up Program to expire at the end of the approved 2014 budget cycle. The Residential and Commercial HVAC Diagnostic and Tune-Up Program targets customers with HVAC system performance issues. The goal of the HVAC Diagnostic Program is to identify common problems that could cause system inefficiencies by conducting a diagnostic performance check on:

- air-restricted indoor and outdoor coils; and
- refrigerant levels that are over- or undercharged.

HVAC systems where one or more of these problems are identified qualify for corrective action in the form of an HVAC Tune-Up. The Residential and Commercial HVAC Diagnostic and Tune-Up program targets customers with HVAC system performance issues, not the market as a whole.

When the Residential and Commercial HVAC Diagnostic and Tune-Up Program was launched in 2009, the operational design of the program required a contractor to make two visits to a home or business, one for the diagnostic test and another to perform the tune-up. Due to the customer impact the program participation fell short of its stated goals. As such, the program model was updated in 2010 to require just one contractor visit, during which both the diagnostic test and the tune-up could be performed. During this time, all HVAC repair and service vendors who met the Companies' criteria were eligible to provide diagnostic and tune-up services to the customer segment.⁹

Customer participation continued to improve year-over-year but never at an anticipated rate as approved by the Commission. Low participation is driven primarily by the downturned economy and competitive pricing from the HVAC service providers. The HVAC service providers have the ability to lower their pricing structures for services in an expedient manner and offer longer-term maintenance contracts which presented challenges for the Companies to sustain and deliver the program as customer participation in its defined and approved in Case No. 2007-00319 program. The Companies have worked to address this diligently, and it is still an ongoing challenge.

Throughout the course of this program, the Companies have implemented various program modifications to attempt to increase program effectiveness and participation, and have employed various marketing and communications strategies in to communicate program eligibility, associated costs, and benefits of the program to residential and commercial customers.

⁹ Eligibility criteria include having a valid Kentucky State HVAC Contractor License; liability insurance; membership in associations that demonstrate the company's commitment to safety, customer service and certified professionalism.

These additional efforts notwithstanding, the HVAC Diagnostic and Tune-Up Program still has not achieved its stated goals. With the natural competitive nature of the HVAC marketplace, the Companies propose to allow the Residential and Commercial HVAC Diagnostic and Tune-Up program to expire at this time. The Companies will continue to monitor the HVAC market and other utility markets to understand how they have successfully implemented HVAC diagnostic and tune-up programs. In addition, the Companies plan to continue dialogue with the HVAC community to explore a programmatic design that will be mutually beneficial and provide an excellent customer experience.

Although the Companies propose to end the Residential and Commercial HVAC Diagnostic and Tune-Up program, there is still opportunity for the residential and commercial customer segments to take advantage of energy efficiency programs that have an HVAC component. The Companies received approval from the Commission on November 9, 2011 in Case No. 2011-00134 for its current DSM/EE Program Plan, which includes a new Home Energy Rebate Program and an expansion of the Commercial Rebate Program. The new Home Energy Rebate Program provides financial rebates to customers who purchase qualified window films and ENERGY STAR[®] qualified appliances and HVAC systems. Residential customers who take advantage of this opportunity can receive \$100 per qualifying central air conditioner purchased.¹⁰ The Commercial Rebate program provides customers an opportunity to customize the program to meet their individual needs and offset the costs for installing high-efficiency equipment which includes commercial air conditioning systems. Commercial customers who take advantage of this opportunity can receive \$10-\$30 per ton. In addition, the approval of these programs offers the Companies a significant increase in energy and demand savings when compared to the HVAC Diagnostic and Tune-Up Program.

Based upon the challenges encountered with the AC Test and Tune up program, approval of the Home Energy Rebate Program, and an expansion of the Commercial Rebate Program to address the needs of customers seeking more efficient HVAC equipment, there is no longer a need to continue to fund this project beyond the approved 2014 budget cycle.

Program Performance

The tables below demonstrate projected program performance through November 2013 in relation to the 2007 filing budget.

¹⁰ Each residential customer who participates can earn an additional \$100 per qualifying item per SEER unit more than the federal SEER standard for qualifying HVAC systems. The maximum customer participation in this program is 2 times.

Residential HVAC Diagnostic and Tune-up Program

	Completed				
	TRC Score	Tune-Ups	Energy (GWh)	Demand (MW)	Financials (\$000)
2007 Filing Budget	1.10	4,518	5.70	2.60	\$2,937
Actuals through November 2013	1.86	2,695	3.40	1.54	\$1,624
Variance		(1,823)	(2.30)	(1.06)	(1,313)

Commercial HVAC Diagnostic and Tune-up Program

	Completed				
	TRC Score	Tune-Ups	Energy (GWh)	Demand (MW)	Financials (\$000)
2007 Filing Budget	1.79	3,510	2.37	9.9	\$2,632
Actuals through November 2013	0.45	31	0.14	0.0	\$498
Variance		(3,479)	(2.24)	(9.89)	(2,135)

LG&E AND KU
2008-2014 EXPIRING DEMAND-SIDE MANAGEMENT AND
ENERGY EFFICIENCY PROGRAMS

Program Name: Dealer Referral Network

The Companies intend to allow the Dealer Referral Network Program to expire at the end of the approved 2014 budget cycle. As part of the 2007 DSM Program filing, the Companies included the Dealer Referral Network to establish and maintain a web based network to:

- Assist customers in finding qualified and reliable personnel to install energy efficiency improvements recommended and/or subsidized by the various energy efficiency programs;
- Identify energy related subcontractors for contractors seeking to build energy efficient homes or improve energy efficiency of existing homes; and
- Fulfill incentives and rebates

The initial focus of the Dealer Referral Network was to provide services to customers participating in the Residential / Commercial HVAC Diagnostic and Tune-Up Program and the Residential New Construction Program. If these programs expire as scheduled at the end of the approved 2014 budget cycle, the major need for the Dealer Referral Network Program will also end. Any remaining support provided by the Dealer Referral Network has been incorporated into individual program operations; therefore, there is no longer a need to continue to fund this project beyond the approved 2014 budget cycle.

Program Performance

The Dealer Referral Network has no energy or demand savings, and program elements have effectively been incorporated into other programming within the DSM / EE program plan.

**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

DSMore Input Summary Reports

Appendix B

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net Free Riders)	One-Time Investments	Annual	Total Costs
11	42	215	42	173	173	\$2,299,510	\$0	\$2,299,510	
2	215	42	429	84	345	\$2,345,501	\$0	\$2,345,501	
3	215	42	644	125	519	\$2,392,411	\$0	\$2,392,411	
4	215	42	858	167	691	\$2,440,259	\$0	\$2,440,259	
5	0	0	858	167	691	\$0	\$0	\$0	
6	0	0	858	167	691	\$0	\$0	\$0	
7	0	0	858	167	691	\$0	\$0	\$0	
8	0	0	858	167	691	\$0	\$0	\$0	
9	0	0	858	167	691	\$0	\$0	\$0	
10	0	0	858	167	691	\$0	\$0	\$0	
11	0	0	858	167	691	\$0	\$0	\$0	
12	0	0	858	167	691	\$0	\$0	\$0	
13	0	0	858	167	691	\$0	\$0	\$0	
14	0	0	858	167	691	\$0	\$0	\$0	
15	0	0	858	167	691	\$0	\$0	\$0	
16	0	0	858	167	691	\$0	\$0	\$0	
17	0	0	858	167	691	\$0	\$0	\$0	
18	0	0	858	167	691	\$0	\$0	\$0	
19	0	0	858	167	691	\$0	\$0	\$0	
20	0	0	858	167	691	\$0	\$0	\$0	
21	0	0	644	125	519	\$0	\$0	\$0	
22	0	0	429	84	345	\$0	\$0	\$0	
23	0	0	215	42	173	\$0	\$0	\$0	
Total	858	167	17160	3346	13814	13814	\$0	\$9,477,681	

Impacts and Savings																							
Year	Electric Impacts/Savings										Gas Impacts/Savings												
	Per Participant										Per Participant												
Year	Cumulative										Yearly Incremental (Per Participant * Incremental Participants)						Cumulative						
	kW	kWh (net)	Summer CO2 (lb)	Summer CO2 (net)	Winter CO2 (lb)	Winter CO2 (net)	kWh	kWh (net)	kW	kWh (net)	Summer CO2 (lb)	Summer CO2 (net)	Winter CO2 (lb)	Winter CO2 (net)	kWh	kWh (net)	CO2 (lb)	CO2 (net)	CO2 (lb)	CO2 (net)			
1	29	23	28	5	4	35,598	28,656	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798
2	29	23	28	5	4	35,598	28,656	12,401	9,983	12,222	9,939	2,359	1,899	15,271,548	12,293,598	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798
3	29	23	28	5	4	35,598	28,656	18,601	14,974	18,333	14,758	3,539	2,849	22,907,322	18,440,394	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798
4	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798
5	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
6	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
7	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
8	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
9	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
10	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
11	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
12	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
13	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
14	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
15	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
16	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
17	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
18	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
19	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
20	29	23	28	5	4	35,598	28,656	24,801	19,965	24,444	19,677	4,719	3,799	30,543,096	24,587,192	0	0	0	0	0	0	0	0
21	29	23	28	5	4	35,598	28,656	18,601	14,974	18,333	14,758	3,539	2,849	22,907,322	18,440,394	0	0	0	0	0	0	0	0
22	29	23	28	5	4	35,598	28,656	12,401	9,983	12,222	9,939	2,359	1,899	15,271,548	12,293,598	0	0	0	0	0	0	0	0
23	29	23	28	5	4	35,598	28,656	6,200	4,991	6,111	4,919	1,180	950	7,635,774	6,146,798	0	0	0	0	0	0	0	0
Total						818,754	659,097				610,861,019	491,743,845			30,543,096	24,587,192	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Parist	Net Free/Parist	Total	Net Free/Parist	Net Free/Parist	Total
1	\$2,992	\$0	\$2,992	\$516,713	\$0	\$516,713	\$516,713	\$0	\$516,713
2	\$3,052	\$0	\$3,052	\$1,054,094	\$0	\$1,054,094	\$1,054,094	\$0	\$1,054,094
3	\$3,113	\$0	\$3,113	\$1,612,764	\$0	\$1,612,764	\$1,612,764	\$0	\$1,612,764
4	\$3,176	\$0	\$3,176	\$2,193,358	\$0	\$2,193,358	\$2,193,358	\$0	\$2,193,358
5	\$3,239	\$0	\$3,239	\$2,837,226	\$0	\$2,837,226	\$2,837,226	\$0	\$2,837,226
6	\$3,304	\$0	\$3,304	\$2,981,970	\$0	\$2,981,970	\$2,981,970	\$0	\$2,981,970
7	\$3,370	\$0	\$3,370	\$2,327,609	\$0	\$2,327,609	\$2,327,609	\$0	\$2,327,609
8	\$3,437	\$0	\$3,437	\$2,374,162	\$0	\$2,374,162	\$2,374,162	\$0	\$2,374,162
9	\$3,506	\$0	\$3,506	\$2,421,645	\$0	\$2,421,645	\$2,421,645	\$0	\$2,421,645
10	\$3,576	\$0	\$3,576	\$2,470,078	\$0	\$2,470,078	\$2,470,078	\$0	\$2,470,078
11	\$3,648	\$0	\$3,648	\$2,519,479	\$0	\$2,519,479	\$2,519,479	\$0	\$2,519,479
12	\$3,721	\$0	\$3,721	\$2,569,869	\$0	\$2,569,869	\$2,569,869	\$0	\$2,569,869
13	\$3,795	\$0	\$3,795	\$2,621,266	\$0	\$2,621,266	\$2,621,266	\$0	\$2,621,266
14	\$3,871	\$0	\$3,871	\$2,673,692	\$0	\$2,673,692	\$2,673,692	\$0	\$2,673,692
15	\$3,948	\$0	\$3,948	\$2,727,165	\$0	\$2,727,165	\$2,727,165	\$0	\$2,727,165
16	\$4,027	\$0	\$4,027	\$2,781,709	\$0	\$2,781,709	\$2,781,709	\$0	\$2,781,709
17	\$4,108	\$0	\$4,108	\$2,837,343	\$0	\$2,837,343	\$2,837,343	\$0	\$2,837,343
18	\$4,190	\$0	\$4,190	\$2,894,090	\$0	\$2,894,090	\$2,894,090	\$0	\$2,894,090
19	\$4,274	\$0	\$4,274	\$2,951,972	\$0	\$2,951,972	\$2,951,972	\$0	\$2,951,972
20	\$4,359	\$0	\$4,359	\$3,011,011	\$0	\$3,011,011	\$3,011,011	\$0	\$3,011,011
21	\$4,447	\$0	\$4,447	\$2,303,423	\$0	\$2,303,423	\$2,303,423	\$0	\$2,303,423
22	\$4,536	\$0	\$4,536	\$1,566,328	\$0	\$1,566,328	\$1,566,328	\$0	\$1,566,328
23	\$4,626	\$0	\$4,626	\$798,827	\$0	\$798,827	\$798,827	\$0	\$798,827
Total	\$86,317	\$0	\$86,317	\$51,745,792	\$0	\$51,745,792	\$51,745,792	\$0	\$51,745,792

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Other	Total	kWh	kWh	kWh	CCF	CCF	CCF
1	\$77,357	\$262,483	\$262,500	\$2,770	\$605,110	\$83	\$103	\$0	\$0	\$0
2	\$80,065	\$267,191	\$262,500	\$2,825	\$612,581	\$42	\$52	\$0	\$0	\$0
3	\$82,867	\$271,994	\$262,500	\$2,881	\$620,242	\$28	\$35	\$0	\$0	\$0
4	\$85,767	\$276,892	\$262,500	\$2,939	\$628,099	\$22	\$27	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$328,057	\$1,078,560	\$1,050,000	\$11,415	\$2,468,031	\$175	\$217	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Participants) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Electric	Capacity	Tag	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas	Total
1	\$435,481	\$491,539	\$0	\$0	\$927,020	\$0	\$0	\$0	\$0	\$0
2	\$898,832	\$1,014,537	\$0	\$0	\$1,913,369	\$0	\$0	\$0	\$0	\$0
3	\$1,391,292	\$1,570,503	\$0	\$0	\$2,961,895	\$0	\$0	\$0	\$0	\$0
4	\$1,914,556	\$2,161,012	\$0	\$0	\$4,075,568	\$0	\$0	\$0	\$0	\$0
5	\$1,975,822	\$2,230,164	\$0	\$0	\$4,205,986	\$0	\$0	\$0	\$0	\$0
6	\$2,039,048	\$2,301,530	\$0	\$0	\$4,340,577	\$0	\$0	\$0	\$0	\$0
7	\$2,104,297	\$2,375,179	\$0	\$0	\$4,479,476	\$0	\$0	\$0	\$0	\$0
8	\$2,171,635	\$2,451,184	\$0	\$0	\$4,622,819	\$0	\$0	\$0	\$0	\$0
9	\$2,241,127	\$2,529,622	\$0	\$0	\$4,770,749	\$0	\$0	\$0	\$0	\$0
10	\$2,312,843	\$2,610,570	\$0	\$0	\$4,923,413	\$0	\$0	\$0	\$0	\$0
11	\$2,386,854	\$2,694,108	\$0	\$0	\$5,080,963	\$0	\$0	\$0	\$0	\$0
12	\$2,463,234	\$2,780,320	\$0	\$0	\$5,243,553	\$0	\$0	\$0	\$0	\$0
13	\$2,542,057	\$2,869,290	\$0	\$0	\$5,411,347	\$0	\$0	\$0	\$0	\$0
14	\$2,623,403	\$2,961,107	\$0	\$0	\$5,584,510	\$0	\$0	\$0	\$0	\$0
15	\$2,707,352	\$3,055,883	\$0	\$0	\$5,763,235	\$0	\$0	\$0	\$0	\$0
16	\$2,793,987	\$3,153,650	\$0	\$0	\$5,947,637	\$0	\$0	\$0	\$0	\$0
17	\$2,883,395	\$3,254,587	\$0	\$0	\$6,137,982	\$0	\$0	\$0	\$0	\$0
18	\$2,975,663	\$3,358,713	\$0	\$0	\$6,334,377	\$0	\$0	\$0	\$0	\$0
19	\$3,070,884	\$3,466,192	\$0	\$0	\$6,537,077	\$0	\$0	\$0	\$0	\$0
20	\$3,169,153	\$3,577,110	\$0	\$0	\$6,746,263	\$0	\$0	\$0	\$0	\$0
21	\$2,452,924	\$2,768,883	\$0	\$0	\$5,221,808	\$0	\$0	\$0	\$0	\$0
22	\$1,687,812	\$1,804,854	\$0	\$0	\$3,492,466	\$0	\$0	\$0	\$0	\$0
23	\$870,808	\$982,905	\$0	\$0	\$1,853,712	\$0	\$0	\$0	\$0	\$0
Total	\$50,112,358	\$56,563,205	\$0	\$0	\$106,675,563	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Participants)										
Year	Cumulative Electric				Cumulative Gas					
	Electric	Capacity	Tag	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas	Total
1	\$435,481	\$491,539	\$0	\$0	\$927,020	\$0	\$0	\$0	\$0	\$0
2	\$898,832	\$1,014,537	\$0	\$0	\$1,913,369	\$0	\$0	\$0	\$0	\$0
3	\$1,391,292	\$1,570,503	\$0	\$0	\$2,961,895	\$0	\$0	\$0	\$0	\$0
4	\$1,914,556	\$2,161,012	\$0	\$0	\$4,075,568	\$0	\$0	\$0	\$0	\$0
5	\$1,975,822	\$2,230,164	\$0	\$0	\$4,205,986	\$0	\$0	\$0	\$0	\$0
6	\$2,039,048	\$2,301,530	\$0	\$0	\$4,340,577	\$0	\$0	\$0	\$0	\$0
7	\$2,104,297	\$2,375,179	\$0	\$0	\$4,479,476	\$0	\$0	\$0	\$0	\$0
8	\$2,171,635	\$2,451,184	\$0	\$0	\$4,622,819	\$0	\$0	\$0	\$0	\$0
9	\$2,241,127	\$2,529,622	\$0	\$0	\$4,770,749	\$0	\$0	\$0	\$0	\$0
10	\$2,312,843	\$2,610,570	\$0	\$0	\$4,923,413	\$0	\$0	\$0	\$0	\$0
11	\$2,386,854	\$2,694,108	\$0	\$0	\$5,080,963	\$0	\$0	\$0	\$0	\$0
12	\$2,463,234	\$2,780,320	\$0	\$0	\$5,243,553	\$0	\$0	\$0	\$0	\$0
13	\$2,542,057	\$2,869,290	\$0	\$0	\$5,411,347	\$0	\$0	\$0	\$0	\$0
14	\$2,623,403	\$2,961,107	\$0	\$0	\$5,584,510	\$0	\$0	\$0	\$0	\$0
15	\$2,707,352	\$3,055,883	\$0	\$0	\$5,763,235	\$0	\$0	\$0	\$0	\$0
16	\$2,793,987	\$3,153,650	\$0	\$0	\$5,947,637	\$0	\$0	\$0	\$0	\$0
17	\$2,883,395	\$3,254,587	\$0	\$0	\$6,137,982	\$0	\$0	\$0	\$0	\$0
18	\$2,975,663	\$3,358,713	\$0	\$0	\$6,334,377	\$0	\$0	\$0	\$0	\$0
19	\$3,070,884	\$3,466,192	\$0	\$0	\$6,537,077	\$0	\$0	\$0	\$0	\$0
20	\$3,169,153	\$3,577,110	\$0	\$0	\$6,746,263	\$0	\$0	\$0	\$0	\$0
21	\$2,452,924	\$2,768,883	\$0	\$0	\$5,221,808	\$0	\$0	\$0	\$0	\$0
22	\$1,687,812	\$1,804,854	\$0	\$0	\$3,492,466	\$0	\$0	\$0	\$0	\$0
23	\$870,808	\$982,905	\$0	\$0	\$1,853,712	\$0	\$0	\$0	\$0	\$0
Total	\$50,112,358	\$56,563,205	\$0	\$0	\$106,675,563	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net Participants)	Cumulative Free Riders (Net Participants)	One-Time Investments	Annual	Total
1	116	23	116	23	93	93	\$1,238,198	\$0	\$1,238,198
2	116	23	231	46	186	186	\$1,262,962	\$0	\$1,262,962
3	116	23	347	68	279	279	\$1,288,211	\$0	\$1,288,211
4	116	23	462	90	372	372	\$1,313,986	\$0	\$1,313,986
5	0	0	462	90	372	372	\$0	\$0	\$0
6	0	0	462	90	372	372	\$0	\$0	\$0
7	0	0	462	90	372	372	\$0	\$0	\$0
8	0	0	462	90	372	372	\$0	\$0	\$0
9	0	0	462	90	372	372	\$0	\$0	\$0
10	0	0	462	90	372	372	\$0	\$0	\$0
11	0	0	462	90	372	372	\$0	\$0	\$0
12	0	0	462	90	372	372	\$0	\$0	\$0
13	0	0	462	90	372	372	\$0	\$0	\$0
14	0	0	462	90	372	372	\$0	\$0	\$0
15	0	0	462	90	372	372	\$0	\$0	\$0
16	0	0	462	90	372	372	\$0	\$0	\$0
17	0	0	462	90	372	372	\$0	\$0	\$0
18	0	0	462	90	372	372	\$0	\$0	\$0
19	0	0	462	90	372	372	\$0	\$0	\$0
20	0	0	462	90	372	372	\$0	\$0	\$0
21	0	0	347	68	279	279	\$0	\$0	\$0
22	0	0	231	45	186	186	\$0	\$0	\$0
23	0	0	116	23	93	93	\$0	\$0	\$0
Total	462	90	9240	1802	7438	7438	\$5,103,367	\$0	\$5,103,367

Impacts and Savings																														
Year	Electric Impacts/Savings										Gas Impacts/Savings																			
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)																			
1	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	3,695	2,975	3,291	2,649	3,144	2,531	14,180,723	11,415,482	0	0	0	0	0	0	
2	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	3,695	2,975	3,291	2,649	3,144	2,531	14,180,723	11,415,482	0	0	0	0	0	0	
3	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	3,695	2,975	3,291	2,649	3,144	2,531	14,180,723	11,415,482	0	0	0	0	0	0	
4	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	3,695	2,975	3,291	2,649	3,144	2,531	14,180,723	11,415,482	0	0	0	0	0	0	
5	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	32	26	28	23	27	122,777	98,835	11,086	8,925	9,872	7,947	9,432	7,593	42,942,169	34,246,446	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	32	26	28	23	27	122,777	98,835	14,782	11,899	13,162	10,595	12,576	10,124	56,722,892	45,661,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	32	26	28	23	27	122,777	98,835	3,695	2,975	3,291	2,649	3,144	2,531	14,180,723	11,415,482	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total																														

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net FreeRider/Participant	Net FreeRider/Participant	Net FreeRider/Participant	Net FreeRider/Participant	Net FreeRider/Participant	Net FreeRider/Participant
1	\$10,321	\$0	\$10,321	\$959,609	\$0	\$959,609	\$959,609	\$0	\$959,609
2	\$10,527	\$0	\$10,527	\$1,957,603	\$0	\$1,957,603	\$1,957,603	\$0	\$1,957,603
3	\$10,738	\$0	\$10,738	\$2,995,132	\$0	\$2,995,132	\$2,995,132	\$0	\$2,995,132
4	\$10,953	\$0	\$10,953	\$4,073,380	\$0	\$4,073,380	\$4,073,380	\$0	\$4,073,380
5	\$11,172	\$0	\$11,172	\$4,154,847	\$0	\$4,154,847	\$4,154,847	\$0	\$4,154,847
6	\$11,395	\$0	\$11,395	\$4,237,944	\$0	\$4,237,944	\$4,237,944	\$0	\$4,237,944
7	\$11,623	\$0	\$11,623	\$4,322,703	\$0	\$4,322,703	\$4,322,703	\$0	\$4,322,703
8	\$11,855	\$0	\$11,855	\$4,409,157	\$0	\$4,409,157	\$4,409,157	\$0	\$4,409,157
9	\$12,093	\$0	\$12,093	\$4,497,340	\$0	\$4,497,340	\$4,497,340	\$0	\$4,497,340
10	\$12,334	\$0	\$12,334	\$4,587,287	\$0	\$4,587,287	\$4,587,287	\$0	\$4,587,287
11	\$12,581	\$0	\$12,581	\$4,679,033	\$0	\$4,679,033	\$4,679,033	\$0	\$4,679,033
12	\$12,833	\$0	\$12,833	\$4,772,614	\$0	\$4,772,614	\$4,772,614	\$0	\$4,772,614
13	\$13,089	\$0	\$13,089	\$4,868,066	\$0	\$4,868,066	\$4,868,066	\$0	\$4,868,066
14	\$13,351	\$0	\$13,351	\$4,965,427	\$0	\$4,965,427	\$4,965,427	\$0	\$4,965,427
15	\$13,618	\$0	\$13,618	\$5,064,736	\$0	\$5,064,736	\$5,064,736	\$0	\$5,064,736
16	\$13,891	\$0	\$13,891	\$5,166,031	\$0	\$5,166,031	\$5,166,031	\$0	\$5,166,031
17	\$14,168	\$0	\$14,168	\$5,269,351	\$0	\$5,269,351	\$5,269,351	\$0	\$5,269,351
18	\$14,452	\$0	\$14,452	\$5,374,738	\$0	\$5,374,738	\$5,374,738	\$0	\$5,374,738
19	\$14,741	\$0	\$14,741	\$5,482,233	\$0	\$5,482,233	\$5,482,233	\$0	\$5,482,233
20	\$15,036	\$0	\$15,036	\$5,591,878	\$0	\$5,591,878	\$5,591,878	\$0	\$5,591,878
21	\$15,336	\$0	\$15,336	\$4,277,786	\$0	\$4,277,786	\$4,277,786	\$0	\$4,277,786
22	\$15,643	\$0	\$15,643	\$2,908,895	\$0	\$2,908,895	\$2,908,895	\$0	\$2,908,895
23	\$15,956	\$0	\$15,956	\$1,483,536	\$0	\$1,483,536	\$1,483,536	\$0	\$1,483,536
Total	\$297,705	\$0	\$297,705	\$96,099,328	\$0	\$96,099,328	\$96,099,328	\$0	\$96,099,328

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Other	Total	kWh	kWh/yr	CCF	CCF/yr	CCCF	
1	\$41,654	\$131,207	\$487,500	\$1,491	\$661,853	\$103	\$128	\$0	\$0	\$0
2	\$43,112	\$133,471	\$487,500	\$1,521	\$665,604	\$52	\$64	\$0	\$0	\$0
3	\$44,621	\$135,781	\$487,500	\$1,552	\$669,453	\$36	\$43	\$0	\$0	\$0
4	\$46,182	\$138,136	\$487,500	\$1,583	\$673,401	\$26	\$33	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$175,569	\$538,598	\$1,950,000	\$6,146	\$2,670,311	\$215	\$268	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Permanence) for Today Scenario									
Year	Cumulative Electric				Cumulative Gas				
	Energy	Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$556,081	\$264,675	\$0	\$0	\$820,756	\$0	\$0	\$0	\$0
2	\$1,147,751	\$546,289	\$0	\$0	\$1,694,040	\$0	\$0	\$0	\$0
3	\$1,776,719	\$846,855	\$0	\$0	\$2,623,574	\$0	\$0	\$0	\$0
4	\$2,444,765	\$1,163,622	\$0	\$0	\$3,608,387	\$0	\$0	\$0	\$0
5	\$2,522,998	\$1,200,858	\$0	\$0	\$3,723,855	\$0	\$0	\$0	\$0
6	\$2,603,734	\$1,239,285	\$0	\$0	\$3,843,019	\$0	\$0	\$0	\$0
7	\$2,687,053	\$1,278,942	\$0	\$0	\$3,965,995	\$0	\$0	\$0	\$0
8	\$2,773,039	\$1,319,868	\$0	\$0	\$4,092,907	\$0	\$0	\$0	\$0
9	\$2,861,776	\$1,362,104	\$0	\$0	\$4,223,880	\$0	\$0	\$0	\$0
10	\$2,953,353	\$1,405,692	\$0	\$0	\$4,359,044	\$0	\$0	\$0	\$0
11	\$3,047,860	\$1,450,674	\$0	\$0	\$4,498,534	\$0	\$0	\$0	\$0
12	\$3,145,392	\$1,497,095	\$0	\$0	\$4,642,487	\$0	\$0	\$0	\$0
13	\$3,246,044	\$1,545,002	\$0	\$0	\$4,791,047	\$0	\$0	\$0	\$0
14	\$3,349,918	\$1,594,442	\$0	\$0	\$4,944,360	\$0	\$0	\$0	\$0
15	\$3,457,115	\$1,645,465	\$0	\$0	\$5,102,580	\$0	\$0	\$0	\$0
16	\$3,567,743	\$1,698,119	\$0	\$0	\$5,265,862	\$0	\$0	\$0	\$0
17	\$3,681,910	\$1,752,459	\$0	\$0	\$5,434,370	\$0	\$0	\$0	\$0
18	\$3,799,732	\$1,808,538	\$0	\$0	\$5,608,270	\$0	\$0	\$0	\$0
19	\$3,921,323	\$1,866,411	\$0	\$0	\$5,787,734	\$0	\$0	\$0	\$0
20	\$4,046,805	\$1,926,136	\$0	\$0	\$5,972,942	\$0	\$0	\$0	\$0
21	\$3,132,227	\$1,490,830	\$0	\$0	\$4,623,057	\$0	\$0	\$0	\$0
22	\$2,154,972	\$1,025,691	\$0	\$0	\$3,180,663	\$0	\$0	\$0	\$0
23	\$1,111,966	\$529,256	\$0	\$0	\$1,641,222	\$0	\$0	\$0	\$0
Total	\$63,980,276	\$30,457,110	\$0	\$0	\$94,447,386	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Permanence)									
Year	Cumulative Electric				Cumulative Gas				
	Energy	Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$556,081	\$264,675	\$0	\$0	\$820,756	\$0	\$0	\$0	\$0
2	\$1,147,751	\$546,289	\$0	\$0	\$1,694,040	\$0	\$0	\$0	\$0
3	\$1,776,719	\$846,855	\$0	\$0	\$2,623,574	\$0	\$0	\$0	\$0
4	\$2,444,765	\$1,163,622	\$0	\$0	\$3,608,387	\$0	\$0	\$0	\$0
5	\$2,522,998	\$1,200,858	\$0	\$0	\$3,723,855	\$0	\$0	\$0	\$0
6	\$2,603,734	\$1,239,285	\$0	\$0	\$3,843,019	\$0	\$0	\$0	\$0
7	\$2,687,053	\$1,278,942	\$0	\$0	\$3,965,995	\$0	\$0	\$0	\$0
8	\$2,773,039	\$1,319,868	\$0	\$0	\$4,092,907	\$0	\$0	\$0	\$0
9	\$2,861,776	\$1,362,104	\$0	\$0	\$4,223,880	\$0	\$0	\$0	\$0
10	\$2,953,353	\$1,405,692	\$0	\$0	\$4,359,044	\$0	\$0	\$0	\$0
11	\$3,047,860	\$1,450,674	\$0	\$0	\$4,498,534	\$0	\$0	\$0	\$0
12	\$3,145,392	\$1,497,095	\$0	\$0	\$4,642,487	\$0	\$0	\$0	\$0
13	\$3,246,044	\$1,545,002	\$0	\$0	\$4,791,047	\$0	\$0	\$0	\$0
14	\$3,349,918	\$1,594,442	\$0	\$0	\$4,944,360	\$0	\$0	\$0	\$0
15	\$3,457,115	\$1,645,465	\$0	\$0	\$5,102,580	\$0	\$0	\$0	\$0
16	\$3,567,743	\$1,698,119	\$0	\$0	\$5,265,862	\$0	\$0	\$0	\$0
17	\$3,681,910	\$1,752,459	\$0	\$0	\$5,434,370	\$0	\$0	\$0	\$0
18	\$3,799,732	\$1,808,538	\$0	\$0	\$5,608,270	\$0	\$0	\$0	\$0
19	\$3,921,323	\$1,866,411	\$0	\$0	\$5,787,734	\$0	\$0	\$0	\$0
20	\$4,046,805	\$1,926,136	\$0	\$0	\$5,972,942	\$0	\$0	\$0	\$0
21	\$3,132,227	\$1,490,830	\$0	\$0	\$4,623,057	\$0	\$0	\$0	\$0
22	\$2,154,972	\$1,025,691	\$0	\$0	\$3,180,663	\$0	\$0	\$0	\$0
23	\$1,111,966	\$529,256	\$0	\$0	\$1,641,222	\$0	\$0	\$0	\$0
Total	\$63,980,276	\$30,457,110	\$0	\$0	\$94,447,386	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/Free Riders)	Cumulative Participants (w/NoParticipants)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																																
Year	Per Participant										Cumulative										Yearly Incremental (Per Participant * Incremental Participants)						Per Participant	Gas Impacts/Savings				
	Electric Impacts/Savings										Gas Impacts/Savings										Per Participant	Gas Impacts/Savings										
	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	kW	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kW	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	CO ₂	CO ₂ (net)	CO ₂	CO ₂ (net)	CO ₂	CO ₂ (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Materials	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh/Net	\$/CCF/Net
1	\$0	\$135,252	\$0	\$1,040	\$136,292	\$0	\$0	\$0	\$0	\$0
2	\$0	\$50,437	\$0	\$1,081	\$51,469	\$0	\$0	\$0	\$0	\$0
3	\$0	\$83,888	\$0	\$1,082	\$84,971	\$0	\$0	\$0	\$0	\$0
4	\$0	\$52,444	\$0	\$1,104	\$53,548	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$321,992	\$0	\$4,288	\$326,280	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr	
1	\$0	\$214,583	\$22,103	\$0	\$236,685	\$31,723	\$31,723	\$14	\$14	\$97	\$97
2	\$0	\$218,974	\$22,103	\$0	\$240,977	\$16,149	\$16,149	\$7	\$7	\$49	\$49
3	\$0	\$217,163	\$44,205	\$0	\$261,368	\$8,758	\$8,758	\$4	\$4	\$27	\$27
4	\$0	\$198,664	\$44,205	\$0	\$240,869	\$5,381	\$5,381	\$2	\$2	\$16	\$16
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$847,294	\$132,615	\$0	\$979,899	\$62,011	\$62,011	\$28	\$28	\$190	\$190

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total		
1	\$869	\$400	\$0	\$0	\$1,270	\$0	\$1,630	\$1,630		\$1,630
2	\$1,773	\$820	\$0	\$0	\$2,593	\$0	\$3,325	\$3,325		\$3,325
3	\$3,618	\$1,679	\$0	\$0	\$5,296	\$0	\$6,782	\$6,782		\$6,782
4	\$5,535	\$2,578	\$0	\$0	\$8,113	\$0	\$10,377	\$10,377		\$10,377
5	\$5,646	\$2,640	\$0	\$0	\$8,286	\$0	\$10,585	\$10,585		\$10,585
6	\$5,759	\$2,704	\$0	\$0	\$8,462	\$0	\$10,796	\$10,796		\$10,796
7	\$5,874	\$2,769	\$0	\$0	\$8,642	\$0	\$11,012	\$11,012		\$11,012
8	\$5,991	\$2,835	\$0	\$0	\$8,828	\$0	\$11,233	\$11,233		\$11,233
9	\$6,111	\$2,903	\$0	\$0	\$9,014	\$0	\$11,457	\$11,457		\$11,457
10	\$6,233	\$2,973	\$0	\$0	\$9,206	\$0	\$11,686	\$11,686		\$11,686
11	\$6,358	\$3,044	\$0	\$0	\$9,402	\$0	\$11,920	\$11,920		\$11,920
12	\$6,485	\$3,117	\$0	\$0	\$9,602	\$0	\$12,159	\$12,159		\$12,159
13	\$6,615	\$3,192	\$0	\$0	\$9,807	\$0	\$12,402	\$12,402		\$12,402
14	\$6,747	\$3,268	\$0	\$0	\$10,016	\$0	\$12,650	\$12,650		\$12,650
15	\$6,882	\$3,347	\$0	\$0	\$10,229	\$0	\$12,903	\$12,903		\$12,903
16	\$7,020	\$3,427	\$0	\$0	\$10,447	\$0	\$13,161	\$13,161		\$13,161
17	\$7,160	\$3,510	\$0	\$0	\$10,670	\$0	\$13,424	\$13,424		\$13,424
18	\$7,303	\$3,594	\$0	\$0	\$10,897	\$0	\$13,693	\$13,693		\$13,693
19	\$7,449	\$3,680	\$0	\$0	\$11,129	\$0	\$13,966	\$13,966		\$13,966
20	\$7,598	\$3,768	\$0	\$0	\$11,367	\$0	\$14,246	\$14,246		\$14,246
21	\$6,459	\$3,216	\$0	\$0	\$9,674	\$0	\$12,109	\$12,109		\$12,109
22	\$5,270	\$2,634	\$0	\$0	\$7,904	\$0	\$9,881	\$9,881		\$9,881
23	\$2,688	\$1,349	\$0	\$0	\$4,037	\$0	\$5,039	\$5,039		\$5,039
Totals	\$131,444	\$63,446	\$0	\$0	\$194,890	\$0	\$246,435	\$246,435		\$246,435

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total		
1	\$869	\$400	\$0	\$0	\$1,270	\$0	\$1,630	\$1,630		\$1,630
2	\$1,773	\$820	\$0	\$0	\$2,593	\$0	\$3,325	\$3,325		\$3,325
3	\$3,618	\$1,679	\$0	\$0	\$5,296	\$0	\$6,782	\$6,782		\$6,782
4	\$5,535	\$2,578	\$0	\$0	\$8,113	\$0	\$10,377	\$10,377		\$10,377
5	\$5,646	\$2,640	\$0	\$0	\$8,286	\$0	\$10,585	\$10,585		\$10,585
6	\$5,759	\$2,704	\$0	\$0	\$8,462	\$0	\$10,796	\$10,796		\$10,796
7	\$5,874	\$2,769	\$0	\$0	\$8,642	\$0	\$11,012	\$11,012		\$11,012
8	\$5,991	\$2,835	\$0	\$0	\$8,828	\$0	\$11,233	\$11,233		\$11,233
9	\$6,111	\$2,903	\$0	\$0	\$9,014	\$0	\$11,457	\$11,457		\$11,457
10	\$6,233	\$2,973	\$0	\$0	\$9,206	\$0	\$11,686	\$11,686		\$11,686
11	\$6,358	\$3,044	\$0	\$0	\$9,402	\$0	\$11,920	\$11,920		\$11,920
12	\$6,485	\$3,117	\$0	\$0	\$9,602	\$0	\$12,159	\$12,159		\$12,159
13	\$6,615	\$3,192	\$0	\$0	\$9,807	\$0	\$12,402	\$12,402		\$12,402
14	\$6,747	\$3,268	\$0	\$0	\$10,016	\$0	\$12,650	\$12,650		\$12,650
15	\$6,882	\$3,347	\$0	\$0	\$10,229	\$0	\$12,903	\$12,903		\$12,903
16	\$7,020	\$3,427	\$0	\$0	\$10,447	\$0	\$13,161	\$13,161		\$13,161
17	\$7,160	\$3,510	\$0	\$0	\$10,670	\$0	\$13,424	\$13,424		\$13,424
18	\$7,303	\$3,594	\$0	\$0	\$10,897	\$0	\$13,693	\$13,693		\$13,693
19	\$7,449	\$3,680	\$0	\$0	\$11,129	\$0	\$13,966	\$13,966		\$13,966
20	\$7,598	\$3,768	\$0	\$0	\$11,367	\$0	\$14,246	\$14,246		\$14,246
21	\$6,459	\$3,216	\$0	\$0	\$9,674	\$0	\$12,109	\$12,109		\$12,109
22	\$5,270	\$2,634	\$0	\$0	\$7,904	\$0	\$9,881	\$9,881		\$9,881
23	\$2,688	\$1,349	\$0	\$0	\$4,037	\$0	\$5,039	\$5,039		\$5,039
Totals	\$131,444	\$63,446	\$0	\$0	\$194,890	\$0	\$246,435	\$246,435		\$246,435

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net/No Riders)	Cumulative Participants (Net/No Riders)	One-Time Investment	Annual	Total
1	1	0	1	0	1	0	\$0	\$0	\$0
2	2	0	2	0	2	2	\$0	\$0	\$0
3	3	0	4	0	4	4	\$0	\$0	\$0
4	4	0	6	0	6	6	\$0	\$0	\$0
5	0	0	6	0	6	6	\$0	\$0	\$0
6	0	0	6	0	6	6	\$0	\$0	\$0
7	0	0	6	0	6	6	\$0	\$0	\$0
8	0	0	6	0	6	6	\$0	\$0	\$0
9	0	0	6	0	6	6	\$0	\$0	\$0
10	0	0	6	0	6	6	\$0	\$0	\$0
11	0	0	6	0	6	6	\$0	\$0	\$0
12	0	0	6	0	6	6	\$0	\$0	\$0
13	0	0	6	0	6	6	\$0	\$0	\$0
14	0	0	6	0	6	6	\$0	\$0	\$0
15	0	0	6	0	6	6	\$0	\$0	\$0
16	0	0	6	0	6	6	\$0	\$0	\$0
17	0	0	6	0	6	6	\$0	\$0	\$0
18	0	0	6	0	6	6	\$0	\$0	\$0
19	0	0	6	0	6	6	\$0	\$0	\$0
20	0	0	6	0	6	6	\$0	\$0	\$0
21	0	0	5	0	5	5	\$0	\$0	\$0
22	0	0	4	0	4	4	\$0	\$0	\$0
23	0	0	2	0	2	2	\$0	\$0	\$0
Totals	6	0	120	0	120	120	\$0	\$0	\$0

Impacts and Savings																										
Year	Electric Impacts/Savings										Gas Impacts/Savings															
	Per Participant		Cumulative		Yearly Incremental (Per Participant * Incremental Participants)		Per Participant		Cumulative		Yearly Incremental															
1	133	133	121	121	119	119	788,377	788,377	133	133	121	121	119	119	788,377	788,377	3,301	3,301	3,301	3,301	3,301	3,301				
2	133	133	121	121	119	119	788,377	788,377	267	267	242	242	238	238	1,576,754	1,576,754	3,301	3,301	6,603	6,603	3,301	3,301				
3	133	133	121	121	119	119	788,377	788,377	533	533	484	484	477	477	3,153,507	3,153,507	267	267	242	242	238	238				
4	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	267	267	242	242	238	238				
5	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
6	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
7	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
8	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
9	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
10	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
11	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
12	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
13	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
14	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
15	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
16	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
17	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
18	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
19	133	133	121	121	119	119	788,377	788,377	800	800	726	726	715	715	4,730,261	4,730,261	0	0	0	0	0	0				
20	133	133	121	121	119	119	788,377	788,377	667	667	605	605	596	596	3,941,884	3,941,884	0	0	0	0	0	0				
21	133	133	121	121	119	119	788,377	788,377	533	533	484	484	477	477	3,153,507	3,153,507	0	0	0	0	0	0				
23	133	133	121	121	119	119	788,377	788,377	267	267	242	242	238	238	1,576,754	1,576,754	0	0	0	0	0	0				
Totals							18,132,666	18,132,666						94,605,215	94,605,215				4,730,261	4,730,261	75,929	75,929	396,154	396,154	19,808	19,808

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Total
1	\$66,273	\$4,004	\$70,277	\$66,273	\$4,004	\$70,277	\$66,273	\$1,873	\$68,145
2	\$67,598	\$4,084	\$71,682	\$135,196	\$8,169	\$143,365	\$135,196	\$3,745	\$138,942
3	\$68,950	\$4,166	\$73,116	\$205,900	\$12,665	\$222,465	\$205,900	\$7,491	\$208,291
4	\$70,329	\$4,249	\$74,578	\$421,974	\$25,497	\$447,471	\$421,974	\$11,236	\$433,210
5	\$71,736	\$4,334	\$76,070	\$630,414	\$38,007	\$668,420	\$630,414	\$15,236	\$645,650
6	\$73,170	\$4,421	\$77,591	\$849,022	\$50,627	\$905,549	\$849,022	\$19,236	\$865,288
7	\$74,634	\$4,510	\$79,143	\$1,077,802	\$62,057	\$1,140,859	\$1,077,802	\$23,236	\$1,100,939
8	\$76,126	\$4,600	\$80,726	\$1,456,758	\$72,598	\$1,530,356	\$1,456,758	\$27,236	\$1,480,955
9	\$77,649	\$4,692	\$82,341	\$1,896,893	\$82,150	\$1,979,043	\$1,896,893	\$31,236	\$1,930,130
10	\$79,202	\$4,786	\$83,987	\$2,408,211	\$90,713	\$2,500,924	\$2,408,211	\$35,236	\$2,440,448
11	\$80,786	\$4,881	\$85,667	\$2,991,716	\$98,288	\$3,089,004	\$2,991,716	\$39,236	\$3,050,622
12	\$82,402	\$4,979	\$87,381	\$3,646,410	\$104,873	\$3,754,283	\$3,646,410	\$43,236	\$3,700,648
13	\$84,050	\$5,078	\$89,128	\$4,375,298	\$110,471	\$4,485,769	\$4,375,298	\$47,236	\$4,330,534
14	\$85,731	\$5,180	\$90,911	\$5,189,029	\$115,084	\$5,304,113	\$5,189,029	\$51,236	\$5,252,620
15	\$87,445	\$5,284	\$92,729	\$6,087,472	\$118,712	\$6,203,814	\$6,087,472	\$55,236	\$6,148,908
16	\$89,194	\$5,389	\$94,584	\$7,070,856	\$121,356	\$7,192,212	\$7,070,856	\$59,236	\$7,139,402
17	\$90,978	\$5,497	\$96,475	\$8,149,883	\$123,013	\$8,272,896	\$8,149,883	\$63,236	\$8,182,105
18	\$92,798	\$5,607	\$98,405	\$9,315,488	\$123,682	\$9,440,170	\$9,315,488	\$67,236	\$9,379,622
19	\$94,654	\$5,719	\$100,373	\$10,576,861	\$123,361	\$10,704,522	\$10,576,861	\$71,236	\$10,633,518
20	\$96,547	\$5,834	\$102,380	\$11,933,241	\$122,051	\$12,055,292	\$11,933,241	\$75,236	\$12,008,516
21	\$98,478	\$5,950	\$104,428	\$13,386,669	\$119,751	\$13,506,420	\$13,386,669	\$79,236	\$13,427,252
22	\$100,447	\$6,069	\$106,516	\$14,946,185	\$116,469	\$15,062,654	\$14,946,185	\$83,236	\$14,984,279
23	\$102,456	\$6,191	\$108,647	\$16,622,832	\$112,202	\$16,735,034	\$16,622,832	\$87,236	\$16,700,658
Totals	\$1,911,631	\$115,505	\$2,027,136	\$10,020,932	\$805,489	\$10,826,421	\$10,020,932	\$224,728	\$10,245,660

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Other	Total	kWh	kWh	kWh	kWh	CCF	CCF	
1	\$0	\$71,528	\$7,368	\$0	\$78,896	\$329	\$329	\$0	\$0	\$24	\$24
2	\$0	\$72,968	\$7,368	\$0	\$80,336	\$167	\$167	\$0	\$0	\$12	\$12
3	\$0	\$72,388	\$14,735	\$0	\$87,123	\$91	\$91	\$0	\$0	\$7	\$7
4	\$0	\$65,555	\$14,735	\$0	\$80,290	\$56	\$56	\$0	\$0	\$4	\$4
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$282,428	\$44,205	\$0	\$326,633	\$642	\$642	\$0	\$0	\$47	\$47

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	TWh	Incubity	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$35,928	\$12,087	\$0	\$0	\$48,015	\$0	\$2,198	\$2,198	\$2,198
2	\$73,293	\$24,753	\$0	\$0	\$98,047	\$0	\$4,483	\$4,483	\$4,483
3	\$149,219	\$50,695	\$0	\$0	\$200,214	\$0	\$9,146	\$9,146	\$9,146
4	\$228,764	\$77,868	\$0	\$0	\$306,631	\$0	\$13,993	\$13,993	\$13,993
5	\$233,339	\$79,737	\$0	\$0	\$313,075	\$0	\$14,273	\$14,273	\$14,273
6	\$238,006	\$81,650	\$0	\$0	\$319,656	\$0	\$14,559	\$14,559	\$14,559
7	\$242,766	\$83,610	\$0	\$0	\$326,376	\$0	\$14,850	\$14,850	\$14,850
8	\$247,621	\$85,616	\$0	\$0	\$333,237	\$0	\$15,147	\$15,147	\$15,147
9	\$252,573	\$87,671	\$0	\$0	\$340,245	\$0	\$15,450	\$15,450	\$15,450
10	\$257,625	\$89,775	\$0	\$0	\$347,400	\$0	\$15,759	\$15,759	\$15,759
11	\$262,777	\$91,930	\$0	\$0	\$354,707	\$0	\$16,074	\$16,074	\$16,074
12	\$268,033	\$94,136	\$0	\$0	\$362,169	\$0	\$16,395	\$16,395	\$16,395
13	\$273,394	\$96,396	\$0	\$0	\$369,790	\$0	\$16,723	\$16,723	\$16,723
14	\$278,862	\$98,709	\$0	\$0	\$377,571	\$0	\$17,058	\$17,058	\$17,058
15	\$284,439	\$101,078	\$0	\$0	\$385,517	\$0	\$17,399	\$17,399	\$17,399
16	\$290,128	\$103,504	\$0	\$0	\$393,631	\$0	\$17,747	\$17,747	\$17,747
17	\$295,930	\$105,988	\$0	\$0	\$401,918	\$0	\$18,102	\$18,102	\$18,102
18	\$301,849	\$108,532	\$0	\$0	\$410,380	\$0	\$18,464	\$18,464	\$18,464
19	\$307,886	\$111,136	\$0	\$0	\$419,022	\$0	\$18,833	\$18,833	\$18,833
20	\$314,043	\$113,804	\$0	\$0	\$427,847	\$0	\$19,210	\$19,210	\$19,210
21	\$266,937	\$97,113	\$0	\$0	\$364,049	\$0	\$16,328	\$16,328	\$16,328
22	\$217,820	\$79,555	\$0	\$0	\$297,375	\$0	\$13,324	\$13,324	\$13,324
23	\$111,088	\$40,732	\$0	\$0	\$151,820	\$0	\$6,795	\$6,795	\$6,795
Totals	\$5,432,619	\$1,916,074	\$0	\$0	\$7,348,693	\$0	\$332,309	\$332,309	\$332,309

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	TWh	Incubity	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$35,928	\$12,087	\$0	\$0	\$48,015	\$0	\$2,198	\$2,198	\$2,198
2	\$73,293	\$24,753	\$0	\$0	\$98,047	\$0	\$4,483	\$4,483	\$4,483
3	\$149,219	\$50,695	\$0	\$0	\$200,214	\$0	\$9,146	\$9,146	\$9,146
4	\$228,764	\$77,868	\$0	\$0	\$306,631	\$0	\$13,993	\$13,993	\$13,993
5	\$233,339	\$79,737	\$0	\$0	\$313,075	\$0	\$14,273	\$14,273	\$14,273
6	\$238,006	\$81,650	\$0	\$0	\$319,656	\$0	\$14,559	\$14,559	\$14,559
7	\$242,766	\$83,610	\$0	\$0	\$326,376	\$0	\$14,850	\$14,850	\$14,850
8	\$247,621	\$85,616	\$0	\$0	\$333,237	\$0	\$15,147	\$15,147	\$15,147
9	\$252,573	\$87,671	\$0	\$0	\$340,245	\$0	\$15,450	\$15,450	\$15,450
10	\$257,625	\$89,775	\$0	\$0	\$347,400	\$0	\$15,759	\$15,759	\$15,759
11	\$262,777	\$91,930	\$0	\$0	\$354,707	\$0	\$16,074	\$16,074	\$16,074
12	\$268,033	\$94,136	\$0	\$0	\$362,169	\$0	\$16,395	\$16,395	\$16,395
13	\$273,394	\$96,396	\$0	\$0	\$369,790	\$0	\$16,723	\$16,723	\$16,723
14	\$278,862	\$98,709	\$0	\$0	\$377,571	\$0	\$17,058	\$17,058	\$17,058
15	\$284,439	\$101,078	\$0	\$0	\$385,517	\$0	\$17,399	\$17,399	\$17,399
16	\$290,128	\$103,504	\$0	\$0	\$393,631	\$0	\$17,747	\$17,747	\$17,747
17	\$295,930	\$105,988	\$0	\$0	\$401,918	\$0	\$18,102	\$18,102	\$18,102
18	\$301,849	\$108,532	\$0	\$0	\$410,380	\$0	\$18,464	\$18,464	\$18,464
19	\$307,886	\$111,136	\$0	\$0	\$419,022	\$0	\$18,833	\$18,833	\$18,833
20	\$314,043	\$113,804	\$0	\$0	\$427,847	\$0	\$19,210	\$19,210	\$19,210
21	\$266,937	\$97,113	\$0	\$0	\$364,049	\$0	\$16,328	\$16,328	\$16,328
22	\$217,820	\$79,555	\$0	\$0	\$297,375	\$0	\$13,324	\$13,324	\$13,324
23	\$111,088	\$40,732	\$0	\$0	\$151,820	\$0	\$6,795	\$6,795	\$6,795
Totals	\$5,432,619	\$1,916,074	\$0	\$0	\$7,348,693	\$0	\$332,309	\$332,309	\$332,309

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net Free Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual Investment	Total Cost
1	42	215	42	173	173	\$2,299,510	\$0	\$2,299,510	
2	215	42	429	84	345	\$2,345,501	\$0	\$2,345,501	
3	215	42	644	125	519	\$2,392,411	\$0	\$2,392,411	
4	215	42	858	167	691	\$2,440,259	\$0	\$2,440,259	
5	0	0	858	167	691	\$0	\$0	\$0	
6	0	0	858	167	691	\$0	\$0	\$0	
7	0	0	858	167	691	\$0	\$0	\$0	
8	0	0	858	167	691	\$0	\$0	\$0	
9	0	0	858	167	691	\$0	\$0	\$0	
10	0	0	858	167	691	\$0	\$0	\$0	
11	0	0	858	167	691	\$0	\$0	\$0	
12	0	0	858	167	691	\$0	\$0	\$0	
13	0	0	858	167	691	\$0	\$0	\$0	
14	0	0	858	167	691	\$0	\$0	\$0	
15	0	0	858	167	691	\$0	\$0	\$0	
16	0	0	858	167	691	\$0	\$0	\$0	
17	0	0	858	167	691	\$0	\$0	\$0	
18	0	0	858	167	691	\$0	\$0	\$0	
19	0	0	858	167	691	\$0	\$0	\$0	
20	0	0	858	167	691	\$0	\$0	\$0	
21	0	0	858	167	691	\$0	\$0	\$0	
22	0	0	429	84	345	\$0	\$0	\$0	
23	0	0	215	42	173	\$0	\$0	\$0	
Total	858	167	17180	3346	13814	\$9,477,681	\$0	\$9,477,681	

Impacts and Savings																											
Year	Per Participant										Electric Impacts/Savings										Gas Impacts/Savings						
	Summer Con (kW)					Winter Con (kW)					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)					Per Participant		Cumulative		Yearly Incremental		
	kW	kWh	kW (net)	Summer Con (kW)	Winter Con (kW)	kW	kWh	kW (net)	Summer Con (kW)	Winter Con (kW)	kW	kWh	kW (net)	Summer Con (kW)	Winter Con (kW)	kW	kWh	kW (net)	Summer Con (kW)	Winter Con (kW)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)	
1	13	13	27	22	5	35,733	28,765	2,864	2,306	5,872	1,170	942	7,664,643	6,170,037	2,864	2,306	5,872	4,727	1,170	942	7,664,643	6,170,037	0	0	0	0	
2	13	11	27	22	5	35,733	28,765	5,729	4,611	11,744	9,454	2,340	1,884	15,239,285	12,340,075	2,864	2,306	5,872	4,727	1,170	942	7,664,643	6,170,037	0	0	0	0
3	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
4	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
5	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
6	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
7	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
8	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
9	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
10	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
11	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
12	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
13	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
14	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
15	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
16	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
17	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
18	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
19	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
20	13	11	27	22	5	35,733	28,765	11,457	9,223	23,487	18,907	4,681	3,768	30,658,571	24,680,149	0	0	0	0	0	0	0	0	0	0	0	0
21	13	11	27	22	5	35,733	28,765	8,593	6,917	17,615	14,180	3,511	2,826	22,993,928	18,510,112	0	0	0	0	0	0	0	0	0	0	0	0
22	13	11	27	22	5	35,733	28,765	5,729	4,611	11,744	9,454	2,340	1,884	15,239,285	12,340,075	0	0	0	0	0	0	0	0	0	0	0	0
23	13	11	27	22	5	35,733	28,765	2,864	2,306	5,872	4,727	1,170	942	7,664,643	6,170,037	0	0	0	0	0	0	0	0	0	0	0	0
Total						821,850	661,589						613,171,415	493,602,989							30,658,671	24,680,149	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Free/Participant	Net Free/Participant	Total
1	\$2,991	\$0	\$2,991	\$516,424	\$0	\$516,424	\$516,424	\$0	\$516,424
2	\$3,051	\$0	\$3,051	\$1,033,505	\$0	\$1,033,505	\$1,033,505	\$0	\$1,033,505
3	\$3,112	\$0	\$3,112	\$1,611,863	\$0	\$1,611,863	\$1,611,863	\$0	\$1,611,863
4	\$3,174	\$0	\$3,174	\$2,192,134	\$0	\$2,192,134	\$2,192,134	\$0	\$2,192,134
5	\$3,237	\$0	\$3,237	\$2,755,977	\$0	\$2,755,977	\$2,755,977	\$0	\$2,755,977
6	\$3,302	\$0	\$3,302	\$2,280,696	\$0	\$2,280,696	\$2,280,696	\$0	\$2,280,696
7	\$3,368	\$0	\$3,368	\$2,326,310	\$0	\$2,326,310	\$2,326,310	\$0	\$2,326,310
8	\$3,435	\$0	\$3,435	\$2,372,896	\$0	\$2,372,896	\$2,372,896	\$0	\$2,372,896
9	\$3,504	\$0	\$3,504	\$2,420,293	\$0	\$2,420,293	\$2,420,293	\$0	\$2,420,293
10	\$3,574	\$0	\$3,574	\$2,468,699	\$0	\$2,468,699	\$2,468,699	\$0	\$2,468,699
11	\$3,646	\$0	\$3,646	\$2,518,073	\$0	\$2,518,073	\$2,518,073	\$0	\$2,518,073
12	\$3,719	\$0	\$3,719	\$2,568,434	\$0	\$2,568,434	\$2,568,434	\$0	\$2,568,434
13	\$3,793	\$0	\$3,793	\$2,619,803	\$0	\$2,619,803	\$2,619,803	\$0	\$2,619,803
14	\$3,869	\$0	\$3,869	\$2,672,199	\$0	\$2,672,199	\$2,672,199	\$0	\$2,672,199
15	\$3,946	\$0	\$3,946	\$2,725,643	\$0	\$2,725,643	\$2,725,643	\$0	\$2,725,643
16	\$4,025	\$0	\$4,025	\$2,780,156	\$0	\$2,780,156	\$2,780,156	\$0	\$2,780,156
17	\$4,106	\$0	\$4,106	\$2,835,759	\$0	\$2,835,759	\$2,835,759	\$0	\$2,835,759
18	\$4,188	\$0	\$4,188	\$2,892,474	\$0	\$2,892,474	\$2,892,474	\$0	\$2,892,474
19	\$4,272	\$0	\$4,272	\$2,950,324	\$0	\$2,950,324	\$2,950,324	\$0	\$2,950,324
20	\$4,357	\$0	\$4,357	\$3,009,330	\$0	\$3,009,330	\$3,009,330	\$0	\$3,009,330
21	\$4,444	\$0	\$4,444	\$2,302,198	\$0	\$2,302,198	\$2,302,198	\$0	\$2,302,198
22	\$4,533	\$0	\$4,533	\$1,565,454	\$0	\$1,565,454	\$1,565,454	\$0	\$1,565,454
23	\$4,624	\$0	\$4,624	\$798,381	\$0	\$798,381	\$798,381	\$0	\$798,381
Total	\$86,269	\$0	\$86,269	\$51,716,908	\$0	\$51,716,908	\$51,716,908	\$0	\$51,716,908

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	kWh	kWh	CCF	CCF	CCF
1	\$77,357	\$262,483	\$262,500	\$2,770	\$605,110	\$86	\$107	\$0	\$0	\$0
2	\$80,065	\$267,911	\$262,500	\$2,625	\$613,101	\$43	\$54	\$0	\$0	\$0
3	\$82,867	\$271,994	\$262,500	\$2,881	\$620,242	\$29	\$36	\$0	\$0	\$0
4	\$85,767	\$276,892	\$262,500	\$2,939	\$628,099	\$22	\$28	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$328,057	\$1,078,560	\$1,050,000	\$11,415	\$2,468,031	\$181	\$225	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenarios									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$438,049	\$472,301	\$0	\$0	\$910,350	\$0	\$0	\$0	\$0
2	\$904,132	\$974,829	\$0	\$0	\$1,878,961	\$0	\$0	\$0	\$0
3	\$1,399,597	\$1,509,035	\$0	\$0	\$2,908,632	\$0	\$0	\$0	\$0
4	\$1,925,846	\$2,078,432	\$0	\$0	\$4,002,277	\$0	\$0	\$0	\$0
5	\$1,987,473	\$2,142,878	\$0	\$0	\$4,130,350	\$0	\$0	\$0	\$0
6	\$2,051,072	\$2,211,450	\$0	\$0	\$4,262,521	\$0	\$0	\$0	\$0
7	\$2,116,706	\$2,282,216	\$0	\$0	\$4,398,922	\$0	\$0	\$0	\$0
8	\$2,184,441	\$2,355,247	\$0	\$0	\$4,539,688	\$0	\$0	\$0	\$0
9	\$2,254,343	\$2,430,615	\$0	\$0	\$4,684,958	\$0	\$0	\$0	\$0
10	\$2,326,482	\$2,508,395	\$0	\$0	\$4,834,876	\$0	\$0	\$0	\$0
11	\$2,400,929	\$2,588,663	\$0	\$0	\$4,989,592	\$0	\$0	\$0	\$0
12	\$2,477,759	\$2,671,500	\$0	\$0	\$5,149,259	\$0	\$0	\$0	\$0
13	\$2,557,047	\$2,766,988	\$0	\$0	\$5,314,036	\$0	\$0	\$0	\$0
14	\$2,638,873	\$2,845,212	\$0	\$0	\$5,484,085	\$0	\$0	\$0	\$0
15	\$2,723,317	\$2,936,259	\$0	\$0	\$5,659,575	\$0	\$0	\$0	\$0
16	\$2,810,463	\$3,030,219	\$0	\$0	\$5,840,682	\$0	\$0	\$0	\$0
17	\$2,900,397	\$3,127,186	\$0	\$0	\$6,027,584	\$0	\$0	\$0	\$0
18	\$2,993,210	\$3,227,256	\$0	\$0	\$6,220,466	\$0	\$0	\$0	\$0
19	\$3,088,993	\$3,330,528	\$0	\$0	\$6,419,521	\$0	\$0	\$0	\$0
20	\$3,187,841	\$3,437,105	\$0	\$0	\$6,624,946	\$0	\$0	\$0	\$0
21	\$2,467,389	\$2,660,319	\$0	\$0	\$5,127,708	\$0	\$0	\$0	\$0
22	\$1,897,563	\$1,830,300	\$0	\$0	\$3,527,863	\$0	\$0	\$0	\$0
23	\$875,943	\$944,435	\$0	\$0	\$1,820,377	\$0	\$0	\$0	\$0
Total	\$50,407,862	\$54,349,367	\$0	\$0	\$104,757,229	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$438,049	\$472,301	\$0	\$0	\$910,349	\$0	\$0	\$0	\$0
2	\$904,132	\$974,829	\$0	\$0	\$1,878,961	\$0	\$0	\$0	\$0
3	\$1,399,597	\$1,509,035	\$0	\$0	\$2,908,632	\$0	\$0	\$0	\$0
4	\$1,925,846	\$2,078,432	\$0	\$0	\$4,002,277	\$0	\$0	\$0	\$0
5	\$1,987,473	\$2,142,878	\$0	\$0	\$4,130,350	\$0	\$0	\$0	\$0
6	\$2,051,072	\$2,211,450	\$0	\$0	\$4,262,521	\$0	\$0	\$0	\$0
7	\$2,116,706	\$2,282,216	\$0	\$0	\$4,398,922	\$0	\$0	\$0	\$0
8	\$2,184,441	\$2,355,247	\$0	\$0	\$4,539,688	\$0	\$0	\$0	\$0
9	\$2,254,343	\$2,430,615	\$0	\$0	\$4,684,958	\$0	\$0	\$0	\$0
10	\$2,326,482	\$2,508,395	\$0	\$0	\$4,834,876	\$0	\$0	\$0	\$0
11	\$2,400,929	\$2,588,663	\$0	\$0	\$4,989,592	\$0	\$0	\$0	\$0
12	\$2,477,759	\$2,671,500	\$0	\$0	\$5,149,259	\$0	\$0	\$0	\$0
13	\$2,557,047	\$2,766,988	\$0	\$0	\$5,314,036	\$0	\$0	\$0	\$0
14	\$2,638,873	\$2,845,212	\$0	\$0	\$5,484,085	\$0	\$0	\$0	\$0
15	\$2,723,317	\$2,936,259	\$0	\$0	\$5,659,575	\$0	\$0	\$0	\$0
16	\$2,810,463	\$3,030,219	\$0	\$0	\$5,840,682	\$0	\$0	\$0	\$0
17	\$2,900,397	\$3,127,186	\$0	\$0	\$6,027,584	\$0	\$0	\$0	\$0
18	\$2,993,210	\$3,227,256	\$0	\$0	\$6,220,466	\$0	\$0	\$0	\$0
19	\$3,088,993	\$3,330,528	\$0	\$0	\$6,419,521	\$0	\$0	\$0	\$0
20	\$3,187,841	\$3,437,105	\$0	\$0	\$6,624,946	\$0	\$0	\$0	\$0
21	\$2,467,389	\$2,660,319	\$0	\$0	\$5,127,708	\$0	\$0	\$0	\$0
22	\$1,897,563	\$1,830,300	\$0	\$0	\$3,527,863	\$0	\$0	\$0	\$0
23	\$875,943	\$944,435	\$0	\$0	\$1,820,377	\$0	\$0	\$0	\$0
Total	\$50,407,862	\$54,349,367	\$0	\$0	\$104,757,229	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net (old/new))	Cumulative Participants (Net (participants))	One-Time Investments	Annual Investments	Total Costs
1	116	23	116	23	93	93	\$1,238,198	\$0	\$1,238,198
2	116	23	231	45	186	186	\$1,262,962	\$0	\$1,262,962
3	116	23	347	68	279	279	\$1,288,211	\$0	\$1,288,211
4	116	23	462	90	372	372	\$1,313,986	\$0	\$1,313,986
5	0	0	462	90	372	372	\$0	\$0	\$0
6	0	0	462	90	372	372	\$0	\$0	\$0
7	0	0	462	90	372	372	\$0	\$0	\$0
8	0	0	462	90	372	372	\$0	\$0	\$0
9	0	0	462	90	372	372	\$0	\$0	\$0
10	0	0	462	90	372	372	\$0	\$0	\$0
11	0	0	462	90	372	372	\$0	\$0	\$0
12	0	0	462	90	372	372	\$0	\$0	\$0
13	0	0	462	90	372	372	\$0	\$0	\$0
14	0	0	462	90	372	372	\$0	\$0	\$0
15	0	0	462	90	372	372	\$0	\$0	\$0
16	0	0	462	90	372	372	\$0	\$0	\$0
17	0	0	462	90	372	372	\$0	\$0	\$0
18	0	0	462	90	372	372	\$0	\$0	\$0
19	0	0	462	90	372	372	\$0	\$0	\$0
20	0	0	462	90	372	372	\$0	\$0	\$0
21	0	0	347	68	279	279	\$0	\$0	\$0
22	0	0	231	45	186	186	\$0	\$0	\$0
23	0	0	116	23	93	93	\$0	\$0	\$0
Total	462	90	9240	1802	7438	7438	\$4,103,367	\$0	\$4,103,367

Impacts and Savings																									
Year	Electric Impacts/Savings										Gas Impacts/Savings														
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)						Per Participant								
Year	kW	kWh (net)	Summer Cdn (kW)	Summer Cdn (kWh)	Winter Cdn (kW)	Winter Cdn (kWh)	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without					
1	19	15	27	22	27	22	123,241	99,209	2,216	1,784	3,162	2,545	3,119	2,511	14,234,336	11,458,641	2,216	1,784	3,162	2,545	3,119	2,511	14,234,336	11,458,641	
2	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
3	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
4	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
5	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
6	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
7	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
8	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
9	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
10	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
11	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
12	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
13	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
14	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
15	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
16	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
17	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
18	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
19	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
20	19	15	27	22	27	22	123,241	99,209	8,865	7,136	12,647	10,181	12,475	10,042	66,937,345	45,834,563	0	0	0	0	0	0	0	0	
21	19	15	27	22	27	22	123,241	99,209	6,849	5,352	8,485	7,836	8,356	7,332	42,703,009	34,375,322	0	0	0	0	0	0	0	0	
22	19	15	27	22	27	22	123,241	99,209	4,433	3,668	6,323	5,090	6,237	5,021	28,468,673	22,917,281	0	0	0	0	0	0	0	0	
23	19	15	27	22	27	22	123,241	99,209	2,216	1,784	3,162	2,545	3,119	2,511	14,234,336	11,458,641	0	0	0	0	0	0	0	0	
Total																									

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Fuel/Participant	Net Fuel/Participant	Total	Net Fuel	Net Fuel	Total
1	\$10,315	\$0	\$10,315	\$959,074	\$0	\$959,074	\$959,074	\$0	\$959,074
2	\$10,521	\$0	\$10,521	\$1,956,510	\$0	\$1,956,510	\$1,956,510	\$0	\$1,956,510
3	\$10,732	\$0	\$10,732	\$2,993,460	\$0	\$2,993,460	\$2,993,460	\$0	\$2,993,460
4	\$10,946	\$0	\$10,946	\$4,071,106	\$0	\$4,071,106	\$4,071,106	\$0	\$4,071,106
5	\$11,165	\$0	\$11,165	\$4,152,528	\$0	\$4,152,528	\$4,152,528	\$0	\$4,152,528
6	\$11,389	\$0	\$11,389	\$4,235,578	\$0	\$4,235,578	\$4,235,578	\$0	\$4,235,578
7	\$11,616	\$0	\$11,616	\$4,320,290	\$0	\$4,320,290	\$4,320,290	\$0	\$4,320,290
8	\$11,849	\$0	\$11,849	\$4,406,696	\$0	\$4,406,696	\$4,406,696	\$0	\$4,406,696
9	\$12,086	\$0	\$12,086	\$4,494,830	\$0	\$4,494,830	\$4,494,830	\$0	\$4,494,830
10	\$12,328	\$0	\$12,328	\$4,584,727	\$0	\$4,584,727	\$4,584,727	\$0	\$4,584,727
11	\$12,574	\$0	\$12,574	\$4,676,421	\$0	\$4,676,421	\$4,676,421	\$0	\$4,676,421
12	\$12,826	\$0	\$12,826	\$4,769,950	\$0	\$4,769,950	\$4,769,950	\$0	\$4,769,950
13	\$13,082	\$0	\$13,082	\$4,865,349	\$0	\$4,865,349	\$4,865,349	\$0	\$4,865,349
14	\$13,344	\$0	\$13,344	\$4,962,656	\$0	\$4,962,656	\$4,962,656	\$0	\$4,962,656
15	\$13,611	\$0	\$13,611	\$5,061,909	\$0	\$5,061,909	\$5,061,909	\$0	\$5,061,909
16	\$13,883	\$0	\$13,883	\$5,163,147	\$0	\$5,163,147	\$5,163,147	\$0	\$5,163,147
17	\$14,160	\$0	\$14,160	\$5,266,410	\$0	\$5,266,410	\$5,266,410	\$0	\$5,266,410
18	\$14,444	\$0	\$14,444	\$5,371,738	\$0	\$5,371,738	\$5,371,738	\$0	\$5,371,738
19	\$14,733	\$0	\$14,733	\$5,479,173	\$0	\$5,479,173	\$5,479,173	\$0	\$5,479,173
20	\$15,027	\$0	\$15,027	\$5,588,756	\$0	\$5,588,756	\$5,588,756	\$0	\$5,588,756
21	\$15,328	\$0	\$15,328	\$4,275,399	\$0	\$4,275,399	\$4,275,399	\$0	\$4,275,399
22	\$15,634	\$0	\$15,634	\$2,907,271	\$0	\$2,907,271	\$2,907,271	\$0	\$2,907,271
23	\$15,947	\$0	\$15,947	\$1,482,708	\$0	\$1,482,708	\$1,482,708	\$0	\$1,482,708
Total	\$297,539	\$0	\$297,539	\$96,045,696	\$0	\$96,045,696	\$96,045,696	\$0	\$96,045,696

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Investigation	Other	Total	kWh	kWh	kWh	CCF	CCF	CCF
1	\$41,654	\$131,207	\$487,500	\$1,491	\$661,853	\$105	\$131	\$0	\$0	\$0
2	\$43,112	\$133,471	\$487,500	\$1,521	\$665,604	\$93	\$66	\$0	\$0	\$0
3	\$44,621	\$136,781	\$487,500	\$1,552	\$669,453	\$36	\$44	\$0	\$0	\$0
4	\$46,182	\$139,136	\$487,500	\$1,583	\$673,401	\$27	\$33	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$175,569	\$538,596	\$1,850,000	\$6,146	\$2,670,311	\$221	\$274	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Permanence) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Address Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$655,393	\$254,316	\$0	\$0	\$909,709	\$0	\$0	\$0	\$0	\$0
2	\$1,146,332	\$524,908	\$0	\$0	\$1,671,240	\$0	\$0	\$0	\$0	\$0
3	\$1,774,522	\$812,257	\$0	\$0	\$2,586,779	\$0	\$0	\$0	\$0	\$0
4	\$2,441,742	\$1,118,079	\$0	\$0	\$3,559,821	\$0	\$0	\$0	\$0	\$0
5	\$2,519,878	\$1,153,857	\$0	\$0	\$3,673,735	\$0	\$0	\$0	\$0	\$0
6	\$2,600,514	\$1,190,781	\$0	\$0	\$3,791,295	\$0	\$0	\$0	\$0	\$0
7	\$2,683,731	\$1,228,886	\$0	\$0	\$3,912,616	\$0	\$0	\$0	\$0	\$0
8	\$2,769,610	\$1,268,210	\$0	\$0	\$4,037,820	\$0	\$0	\$0	\$0	\$0
9	\$2,858,238	\$1,308,793	\$0	\$0	\$4,167,030	\$0	\$0	\$0	\$0	\$0
10	\$2,949,701	\$1,350,674	\$0	\$0	\$4,300,375	\$0	\$0	\$0	\$0	\$0
11	\$3,044,092	\$1,393,898	\$0	\$0	\$4,437,990	\$0	\$0	\$0	\$0	\$0
12	\$3,141,503	\$1,438,500	\$0	\$0	\$4,580,003	\$0	\$0	\$0	\$0	\$0
13	\$3,242,031	\$1,484,532	\$0	\$0	\$4,726,563	\$0	\$0	\$0	\$0	\$0
14	\$3,345,776	\$1,532,037	\$0	\$0	\$4,877,813	\$0	\$0	\$0	\$0	\$0
15	\$3,452,841	\$1,581,062	\$0	\$0	\$5,033,903	\$0	\$0	\$0	\$0	\$0
16	\$3,563,331	\$1,631,656	\$0	\$0	\$5,194,988	\$0	\$0	\$0	\$0	\$0
17	\$3,677,358	\$1,683,869	\$0	\$0	\$5,361,228	\$0	\$0	\$0	\$0	\$0
18	\$3,795,034	\$1,737,753	\$0	\$0	\$5,532,787	\$0	\$0	\$0	\$0	\$0
19	\$3,916,475	\$1,793,361	\$0	\$0	\$5,709,836	\$0	\$0	\$0	\$0	\$0
20	\$4,041,802	\$1,850,749	\$0	\$0	\$5,892,551	\$0	\$0	\$0	\$0	\$0
21	\$3,128,355	\$1,432,480	\$0	\$0	\$4,560,834	\$0	\$0	\$0	\$0	\$0
22	\$2,152,308	\$985,546	\$0	\$0	\$3,137,854	\$0	\$0	\$0	\$0	\$0
23	\$1,110,591	\$508,542	\$0	\$0	\$1,619,133	\$0	\$0	\$0	\$0	\$0
Total	\$63,911,157	\$29,265,044	\$0	\$0	\$93,176,201	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Permanence)										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$555,393	\$254,316	\$0	\$0	\$809,709	\$0	\$0	\$0	\$0	\$0
2	\$1,146,332	\$524,908	\$0	\$0	\$1,671,240	\$0	\$0	\$0	\$0	\$0
3	\$1,774,522	\$812,257	\$0	\$0	\$2,586,779	\$0	\$0	\$0	\$0	\$0
4	\$2,441,742	\$1,118,079	\$0	\$0	\$3,559,821	\$0	\$0	\$0	\$0	\$0
5	\$2,519,878	\$1,153,857	\$0	\$0	\$3,673,735	\$0	\$0	\$0	\$0	\$0
6	\$2,600,514	\$1,190,781	\$0	\$0	\$3,791,295	\$0	\$0	\$0	\$0	\$0
7	\$2,683,731	\$1,228,886	\$0	\$0	\$3,912,616	\$0	\$0	\$0	\$0	\$0
8	\$2,769,610	\$1,268,210	\$0	\$0	\$4,037,820	\$0	\$0	\$0	\$0	\$0
9	\$2,858,238	\$1,308,793	\$0	\$0	\$4,167,030	\$0	\$0	\$0	\$0	\$0
10	\$2,949,701	\$1,350,674	\$0	\$0	\$4,300,375	\$0	\$0	\$0	\$0	\$0
11	\$3,044,092	\$1,393,898	\$0	\$0	\$4,437,990	\$0	\$0	\$0	\$0	\$0
12	\$3,141,503	\$1,438,500	\$0	\$0	\$4,580,003	\$0	\$0	\$0	\$0	\$0
13	\$3,242,031	\$1,484,532	\$0	\$0	\$4,726,563	\$0	\$0	\$0	\$0	\$0
14	\$3,345,776	\$1,532,037	\$0	\$0	\$4,877,813	\$0	\$0	\$0	\$0	\$0
15	\$3,452,841	\$1,581,062	\$0	\$0	\$5,033,903	\$0	\$0	\$0	\$0	\$0
16	\$3,563,331	\$1,631,656	\$0	\$0	\$5,194,988	\$0	\$0	\$0	\$0	\$0
17	\$3,677,358	\$1,683,869	\$0	\$0	\$5,361,228	\$0	\$0	\$0	\$0	\$0
18	\$3,795,034	\$1,737,753	\$0	\$0	\$5,532,787	\$0	\$0	\$0	\$0	\$0
19	\$3,916,475	\$1,793,361	\$0	\$0	\$5,709,836	\$0	\$0	\$0	\$0	\$0
20	\$4,041,802	\$1,850,749	\$0	\$0	\$5,892,551	\$0	\$0	\$0	\$0	\$0
21	\$3,128,355	\$1,432,480	\$0	\$0	\$4,560,834	\$0	\$0	\$0	\$0	\$0
22	\$2,152,308	\$985,546	\$0	\$0	\$3,137,854	\$0	\$0	\$0	\$0	\$0
23	\$1,110,591	\$508,542	\$0	\$0	\$1,619,133	\$0	\$0	\$0	\$0	\$0
Total	\$63,911,157	\$29,265,044	\$0	\$0	\$93,176,201	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs								
Year	Participation						Total Participant Costs	
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/Free Riders)	Cumulative Participants (w/NoParticipants)	One-Time Investment	Annual Investment
1	0	0	0	0	0	0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0

Impacts and Savings																																
Year	Per Participant										Cumulative										Yearly Incremental (Per Participant * Incremental Participants)						Per Participant	Gas Impacts/Savings				
	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	kW	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kW	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Materials	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF
1	\$0	\$135,252	\$0	\$1,040	\$136,292	\$0	\$0	\$0	\$0	\$0
2	\$0	\$50,437	\$0	\$1,081	\$51,469	\$0	\$0	\$0	\$0	\$0
3	\$0	\$83,888	\$0	\$1,082	\$84,971	\$0	\$0	\$0	\$0	\$0
4	\$0	\$52,444	\$0	\$1,104	\$53,548	\$0	\$0	\$0	\$0	\$0
Totals										
	\$0	\$321,992	\$0	\$4,288	\$326,280	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Totals										
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Totals										
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Other	Total	kWh	kWh	kWh	kWh	CCF	CCF	
1	\$0	\$214,583	\$22,103	\$0	\$236,685	\$49,593	\$49,593	\$20	\$20	\$97	\$97
2	\$0	\$218,874	\$22,103	\$0	\$240,977	\$25,246	\$25,246	\$10	\$10	\$49	\$49
3	\$0	\$217,163	\$44,205	\$0	\$261,368	\$13,691	\$13,691	\$6	\$6	\$27	\$27
4	\$0	\$198,664	\$44,205	\$0	\$240,869	\$9,412	\$9,412	\$3	\$3	\$16	\$16
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$847,294	\$132,615	\$0	\$979,909	\$96,941	\$96,941	\$40	\$40	\$190	\$190

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario											
Year	Cumulative Electric				Cumulative Gas						
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$577	\$239	\$0	\$0	\$815	\$0	\$1,630	\$1,630	\$0	\$1,630	\$1,630
2	\$1,176	\$489	\$0	\$0	\$1,665	\$0	\$3,325	\$3,325	\$0	\$3,325	\$3,325
3	\$2,399	\$1,002	\$0	\$0	\$3,401	\$0	\$6,782	\$6,782	\$0	\$6,782	\$6,782
4	\$3,671	\$1,539	\$0	\$0	\$5,210	\$0	\$10,377	\$10,377	\$0	\$10,377	\$10,377
5	\$3,744	\$1,576	\$0	\$0	\$5,320	\$0	\$10,585	\$10,585	\$0	\$10,585	\$10,585
6	\$3,819	\$1,614	\$0	\$0	\$5,433	\$0	\$10,796	\$10,796	\$0	\$10,796	\$10,796
7	\$3,895	\$1,653	\$0	\$0	\$5,548	\$0	\$11,012	\$11,012	\$0	\$11,012	\$11,012
8	\$3,973	\$1,693	\$0	\$0	\$5,666	\$0	\$11,233	\$11,233	\$0	\$11,233	\$11,233
9	\$4,053	\$1,733	\$0	\$0	\$5,786	\$0	\$11,457	\$11,457	\$0	\$11,457	\$11,457
10	\$4,134	\$1,775	\$0	\$0	\$5,909	\$0	\$11,686	\$11,686	\$0	\$11,686	\$11,686
11	\$4,217	\$1,817	\$0	\$0	\$6,034	\$0	\$11,920	\$11,920	\$0	\$11,920	\$11,920
12	\$4,301	\$1,861	\$0	\$0	\$6,162	\$0	\$12,159	\$12,159	\$0	\$12,159	\$12,159
13	\$4,387	\$1,906	\$0	\$0	\$6,293	\$0	\$12,402	\$12,402	\$0	\$12,402	\$12,402
14	\$4,475	\$1,951	\$0	\$0	\$6,426	\$0	\$12,650	\$12,650	\$0	\$12,650	\$12,650
15	\$4,564	\$1,998	\$0	\$0	\$6,562	\$0	\$12,903	\$12,903	\$0	\$12,903	\$12,903
16	\$4,655	\$2,046	\$0	\$0	\$6,702	\$0	\$13,161	\$13,161	\$0	\$13,161	\$13,161
17	\$4,748	\$2,095	\$0	\$0	\$6,844	\$0	\$13,424	\$13,424	\$0	\$13,424	\$13,424
18	\$4,843	\$2,146	\$0	\$0	\$6,989	\$0	\$13,693	\$13,693	\$0	\$13,693	\$13,693
19	\$4,940	\$2,197	\$0	\$0	\$7,137	\$0	\$13,966	\$13,966	\$0	\$13,966	\$13,966
20	\$5,039	\$2,250	\$0	\$0	\$7,289	\$0	\$14,246	\$14,246	\$0	\$14,246	\$14,246
21	\$4,283	\$1,920	\$0	\$0	\$6,203	\$0	\$12,109	\$12,109	\$0	\$12,109	\$12,109
22	\$3,495	\$1,573	\$0	\$0	\$5,068	\$0	\$9,881	\$9,881	\$0	\$9,881	\$9,881
23	\$1,783	\$805	\$0	\$0	\$2,588	\$0	\$5,039	\$5,039	\$0	\$5,039	\$5,039
Totals	\$87,172	\$37,879	\$0	\$0	\$125,051	\$0	\$246,435	\$246,435	\$0	\$246,435	\$246,435

Cost-Based Avoided Costs (Net Free Riders/Persistence)											
Year	Cumulative Electric				Cumulative Gas						
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$577	\$239	\$0	\$0	\$815	\$0	\$1,630	\$1,630	\$0	\$1,630	\$1,630
2	\$1,176	\$489	\$0	\$0	\$1,665	\$0	\$3,325	\$3,325	\$0	\$3,325	\$3,325
3	\$2,399	\$1,002	\$0	\$0	\$3,401	\$0	\$6,782	\$6,782	\$0	\$6,782	\$6,782
4	\$3,671	\$1,539	\$0	\$0	\$5,210	\$0	\$10,377	\$10,377	\$0	\$10,377	\$10,377
5	\$3,744	\$1,576	\$0	\$0	\$5,320	\$0	\$10,585	\$10,585	\$0	\$10,585	\$10,585
6	\$3,819	\$1,614	\$0	\$0	\$5,433	\$0	\$10,796	\$10,796	\$0	\$10,796	\$10,796
7	\$3,895	\$1,653	\$0	\$0	\$5,548	\$0	\$11,012	\$11,012	\$0	\$11,012	\$11,012
8	\$3,973	\$1,693	\$0	\$0	\$5,666	\$0	\$11,233	\$11,233	\$0	\$11,233	\$11,233
9	\$4,053	\$1,733	\$0	\$0	\$5,786	\$0	\$11,457	\$11,457	\$0	\$11,457	\$11,457
10	\$4,134	\$1,775	\$0	\$0	\$5,909	\$0	\$11,686	\$11,686	\$0	\$11,686	\$11,686
11	\$4,217	\$1,817	\$0	\$0	\$6,034	\$0	\$11,920	\$11,920	\$0	\$11,920	\$11,920
12	\$4,301	\$1,861	\$0	\$0	\$6,162	\$0	\$12,159	\$12,159	\$0	\$12,159	\$12,159
13	\$4,387	\$1,906	\$0	\$0	\$6,293	\$0	\$12,402	\$12,402	\$0	\$12,402	\$12,402
14	\$4,475	\$1,951	\$0	\$0	\$6,426	\$0	\$12,650	\$12,650	\$0	\$12,650	\$12,650
15	\$4,564	\$1,998	\$0	\$0	\$6,562	\$0	\$12,903	\$12,903	\$0	\$12,903	\$12,903
16	\$4,655	\$2,046	\$0	\$0	\$6,702	\$0	\$13,161	\$13,161	\$0	\$13,161	\$13,161
17	\$4,748	\$2,095	\$0	\$0	\$6,844	\$0	\$13,424	\$13,424	\$0	\$13,424	\$13,424
18	\$4,843	\$2,146	\$0	\$0	\$6,989	\$0	\$13,693	\$13,693	\$0	\$13,693	\$13,693
19	\$4,940	\$2,197	\$0	\$0	\$7,137	\$0	\$13,966	\$13,966	\$0	\$13,966	\$13,966
20	\$5,039	\$2,250	\$0	\$0	\$7,289	\$0	\$14,246	\$14,246	\$0	\$14,246	\$14,246
21	\$4,283	\$1,920	\$0	\$0	\$6,203	\$0	\$12,109	\$12,109	\$0	\$12,109	\$12,109
22	\$3,495	\$1,573	\$0	\$0	\$5,068	\$0	\$9,881	\$9,881	\$0	\$9,881	\$9,881
23	\$1,783	\$805	\$0	\$0	\$2,588	\$0	\$5,039	\$5,039	\$0	\$5,039	\$5,039
Totals	\$87,172	\$37,879	\$0	\$0	\$125,051	\$0	\$246,435	\$246,435	\$0	\$246,435	\$246,435

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (Net/No Riders)	Participants (Net/No Riders)	One-Time Investment	Annual Costs	Total Costs
1	1	0	1	0	1	1	\$0	\$0	\$0
2	2	0	2	0	2	2	\$0	\$0	\$0
3	3	0	3	0	3	3	\$0	\$0	\$0
4	4	0	4	0	4	4	\$0	\$0	\$0
5	5	0	5	0	5	5	\$0	\$0	\$0
6	6	0	6	0	6	6	\$0	\$0	\$0
7	7	0	7	0	7	7	\$0	\$0	\$0
8	8	0	8	0	8	8	\$0	\$0	\$0
9	9	0	9	0	9	9	\$0	\$0	\$0
10	10	0	10	0	10	10	\$0	\$0	\$0
11	11	0	11	0	11	11	\$0	\$0	\$0
12	12	0	12	0	12	12	\$0	\$0	\$0
13	13	0	13	0	13	13	\$0	\$0	\$0
14	14	0	14	0	14	14	\$0	\$0	\$0
15	15	0	15	0	15	15	\$0	\$0	\$0
16	16	0	16	0	16	16	\$0	\$0	\$0
17	17	0	17	0	17	17	\$0	\$0	\$0
18	18	0	18	0	18	18	\$0	\$0	\$0
19	19	0	19	0	19	19	\$0	\$0	\$0
20	20	0	20	0	20	20	\$0	\$0	\$0
21	21	0	21	0	21	21	\$0	\$0	\$0
22	22	0	22	0	22	22	\$0	\$0	\$0
23	23	0	23	0	23	23	\$0	\$0	\$0
24	24	0	24	0	24	24	\$0	\$0	\$0
25	25	0	25	0	25	25	\$0	\$0	\$0
26	26	0	26	0	26	26	\$0	\$0	\$0
27	27	0	27	0	27	27	\$0	\$0	\$0
28	28	0	28	0	28	28	\$0	\$0	\$0
29	29	0	29	0	29	29	\$0	\$0	\$0
30	30	0	30	0	30	30	\$0	\$0	\$0
31	31	0	31	0	31	31	\$0	\$0	\$0
32	32	0	32	0	32	32	\$0	\$0	\$0
33	33	0	33	0	33	33	\$0	\$0	\$0
34	34	0	34	0	34	34	\$0	\$0	\$0
35	35	0	35	0	35	35	\$0	\$0	\$0
36	36	0	36	0	36	36	\$0	\$0	\$0
37	37	0	37	0	37	37	\$0	\$0	\$0
38	38	0	38	0	38	38	\$0	\$0	\$0
39	39	0	39	0	39	39	\$0	\$0	\$0
40	40	0	40	0	40	40	\$0	\$0	\$0
41	41	0	41	0	41	41	\$0	\$0	\$0
42	42	0	42	0	42	42	\$0	\$0	\$0
43	43	0	43	0	43	43	\$0	\$0	\$0
44	44	0	44	0	44	44	\$0	\$0	\$0
45	45	0	45	0	45	45	\$0	\$0	\$0
46	46	0	46	0	46	46	\$0	\$0	\$0
47	47	0	47	0	47	47	\$0	\$0	\$0
48	48	0	48	0	48	48	\$0	\$0	\$0
49	49	0	49	0	49	49	\$0	\$0	\$0
50	50	0	50	0	50	50	\$0	\$0	\$0
51	51	0	51	0	51	51	\$0	\$0	\$0
52	52	0	52	0	52	52	\$0	\$0	\$0
53	53	0	53	0	53	53	\$0	\$0	\$0
54	54	0	54	0	54	54	\$0	\$0	\$0
55	55	0	55	0	55	55	\$0	\$0	\$0
56	56	0	56	0	56	56	\$0	\$0	\$0
57	57	0	57	0	57	57	\$0	\$0	\$0
58	58	0	58	0	58	58	\$0	\$0	\$0
59	59	0	59	0	59	59	\$0	\$0	\$0
60	60	0	60	0	60	60	\$0	\$0	\$0
61	61	0	61	0	61	61	\$0	\$0	\$0
62	62	0	62	0	62	62	\$0	\$0	\$0
63	63	0	63	0	63	63	\$0	\$0	\$0
64	64	0	64	0	64	64	\$0	\$0	\$0
65	65	0	65	0	65	65	\$0	\$0	\$0
66	66	0	66	0	66	66	\$0	\$0	\$0
67	67	0	67	0	67	67	\$0	\$0	\$0
68	68	0	68	0	68	68	\$0	\$0	\$0
69	69	0	69	0	69	69	\$0	\$0	\$0
70	70	0	70	0	70	70	\$0	\$0	\$0
71	71	0	71	0	71	71	\$0	\$0	\$0
72	72	0	72	0	72	72	\$0	\$0	\$0
73	73	0	73	0	73	73	\$0	\$0	\$0
74	74	0	74	0	74	74	\$0	\$0	\$0
75	75	0	75	0	75	75	\$0	\$0	\$0
76	76	0	76	0	76	76	\$0	\$0	\$0
77	77	0	77	0	77	77	\$0	\$0	\$0
78	78	0	78	0	78	78	\$0	\$0	\$0
79	79	0	79	0	79	79	\$0	\$0	\$0
80	80	0	80	0	80	80	\$0	\$0	\$0
81	81	0	81	0	81	81	\$0	\$0	\$0
82	82	0	82	0	82	82	\$0	\$0	\$0
83	83	0	83	0	83	83	\$0	\$0	\$0
84	84	0	84	0	84	84	\$0	\$0	\$0
85	85	0	85	0	85	85	\$0	\$0	\$0
86	86	0	86	0	86	86	\$0	\$0	\$0
87	87	0	87	0	87	87	\$0	\$0	\$0
88	88	0	88	0	88	88	\$0	\$0	\$0
89	89	0	89	0	89	89	\$0	\$0	\$0
90	90	0	90	0	90	90	\$0	\$0	\$0
91	91	0	91	0	91	91	\$0	\$0	\$0
92	92	0	92	0	92	92	\$0	\$0	\$0
93	93	0	93	0	93	93	\$0	\$0	\$0
94	94	0	94	0	94	94	\$0	\$0	\$0
95	95	0	95	0	95	95	\$0	\$0	\$0
96	96	0	96	0	96	96	\$0	\$0	\$0
97	97	0	97	0	97	97	\$0	\$0	\$0
98	98	0	98	0	98	98	\$0	\$0	\$0
99	99	0	99	0	99	99	\$0	\$0	\$0
100	100	0	100	0	100	100	\$0	\$0	\$0
Total	6	0	120	0	120	120	\$0	\$0	\$0

Impacts and Savings																						
Year	Electric Impacts/Savings										Gas Impacts/Savings											
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)						Per Participant					
Year	kW	kWh (net)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	Net Peak (kW)	Net Peak (kWh)	Net Peak (kW)	Net Peak (kWh)	Yearly Incremental (kW)	Yearly Incremental (kWh)	Yearly Incremental (kW)	Yearly Incremental (kWh)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)		
1	117	117	103	103	97	97	660,990	660,990	117	117	117	117	103	103	97	97	660,990	660,990	3,301	3,301	3,301	3,301
2	117	117	103	103	97	97	660,990	660,990	234	234	207	207	195	195	195	195	1,321,981	1,321,981	3,301	3,301	6,603	6,603
3	117	117	103	103	97	97	660,990	660,990	469	469	414	414	389	389	389	389	2,643,961	2,643,961	3,301	3,301	13,206	13,206
4	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	3,301	3,301	19,808	19,808
5	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
6	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
7	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
8	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
9	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
10	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
11	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
12	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
13	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
14	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
15	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
16	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
17	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
18	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
19	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
20	117	117	103	103	97	97	660,990	660,990	703	703	621	621	584	584	584	584	3,965,942	3,965,942	0	0	0	0
21	117	117	103	103	97	97	660,990	660,990	586	586	517	517	486	486	3,304,951	3,304,951	0	0	0	0		
22	117	117	103	103	97	97	660,990	660,990	469	469	414	414	389	389	2,643,961	2,643,961	0	0	0	0		
23	117	117	103	103	97	97	660,990	660,990	234	234	207	207	195	195	1,321,981	1,321,981	0	0	0	0		
Total									15,202,777	15,202,777			79,318,834	79,318,834			3,965,942	3,965,942	75,929	75,929	396,154	396,154

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ	
1	\$0	\$71,528	\$7,368	\$0	\$78,896	\$393	\$393	\$0	\$0	\$24	\$24
2	\$0	\$72,388	\$7,368	\$0	\$80,328	\$200	\$200	\$0	\$0	\$12	\$12
3	\$0	\$72,388	\$14,735	\$0	\$87,123	\$108	\$108	\$0	\$0	\$7	\$7
4	\$0	\$65,555	\$14,735	\$0	\$80,290	\$67	\$67	\$0	\$0	\$4	\$4
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$282,428	\$44,205	\$0	\$326,633	\$768	\$768	\$0	\$0	\$47	\$47

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario											
Year	Cumulative Electric				Cumulative Gas						
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$30,300	\$10,340	\$0	\$0	\$40,641	\$0	\$2,198	\$2,198	\$0	\$2,198	\$2,198
2	\$61,812	\$21,177	\$0	\$0	\$82,990	\$0	\$4,483	\$4,483	\$0	\$4,483	\$4,483
3	\$126,097	\$43,371	\$0	\$0	\$169,468	\$0	\$9,146	\$9,146	\$0	\$9,146	\$9,146
4	\$192,929	\$66,618	\$0	\$0	\$259,547	\$0	\$13,993	\$13,993	\$0	\$13,993	\$13,993
5	\$196,787	\$68,217	\$0	\$0	\$265,004	\$0	\$14,273	\$14,273	\$0	\$14,273	\$14,273
6	\$200,723	\$69,854	\$0	\$0	\$270,577	\$0	\$14,559	\$14,559	\$0	\$14,559	\$14,559
7	\$204,738	\$71,530	\$0	\$0	\$276,268	\$0	\$14,850	\$14,850	\$0	\$14,850	\$14,850
8	\$208,832	\$73,247	\$0	\$0	\$282,080	\$0	\$15,147	\$15,147	\$0	\$15,147	\$15,147
9	\$213,009	\$75,005	\$0	\$0	\$288,014	\$0	\$15,450	\$15,450	\$0	\$15,450	\$15,450
10	\$217,269	\$76,805	\$0	\$0	\$294,074	\$0	\$15,759	\$15,759	\$0	\$15,759	\$15,759
11	\$221,615	\$78,649	\$0	\$0	\$300,263	\$0	\$16,074	\$16,074	\$0	\$16,074	\$16,074
12	\$226,047	\$80,536	\$0	\$0	\$306,583	\$0	\$16,395	\$16,395	\$0	\$16,395	\$16,395
13	\$230,568	\$82,469	\$0	\$0	\$313,037	\$0	\$16,723	\$16,723	\$0	\$16,723	\$16,723
14	\$235,179	\$84,448	\$0	\$0	\$319,627	\$0	\$17,058	\$17,058	\$0	\$17,058	\$17,058
15	\$239,883	\$86,475	\$0	\$0	\$326,358	\$0	\$17,399	\$17,399	\$0	\$17,399	\$17,399
16	\$244,680	\$88,550	\$0	\$0	\$333,231	\$0	\$17,747	\$17,747	\$0	\$17,747	\$17,747
17	\$249,574	\$90,676	\$0	\$0	\$340,250	\$0	\$18,102	\$18,102	\$0	\$18,102	\$18,102
18	\$254,566	\$92,852	\$0	\$0	\$347,417	\$0	\$18,464	\$18,464	\$0	\$18,464	\$18,464
19	\$259,657	\$95,080	\$0	\$0	\$354,737	\$0	\$18,833	\$18,833	\$0	\$18,833	\$18,833
20	\$264,850	\$97,362	\$0	\$0	\$362,212	\$0	\$19,210	\$19,210	\$0	\$19,210	\$19,210
21	\$225,123	\$63,082	\$0	\$0	\$308,205	\$0	\$16,328	\$16,328	\$0	\$16,328	\$16,328
22	\$183,700	\$68,061	\$0	\$0	\$251,761	\$0	\$13,324	\$13,324	\$0	\$13,324	\$13,324
23	\$93,687	\$34,847	\$0	\$0	\$128,534	\$0	\$6,795	\$6,795	\$0	\$6,795	\$6,795
Totals	\$4,581,626	\$1,639,252	\$0	\$0	\$6,220,878	\$0	\$332,308	\$332,308	\$0	\$332,308	\$332,308

Cost-Based Avoided Costs (Net Free Riders/Persistence)											
Year	Cumulative Electric				Cumulative Gas						
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$30,300	\$10,340	\$0	\$0	\$40,641	\$0	\$2,198	\$2,198	\$0	\$2,198	\$2,198
2	\$61,812	\$21,177	\$0	\$0	\$82,990	\$0	\$4,483	\$4,483	\$0	\$4,483	\$4,483
3	\$126,097	\$43,371	\$0	\$0	\$169,468	\$0	\$9,146	\$9,146	\$0	\$9,146	\$9,146
4	\$192,929	\$66,618	\$0	\$0	\$259,547	\$0	\$13,993	\$13,993	\$0	\$13,993	\$13,993
5	\$196,787	\$68,217	\$0	\$0	\$265,004	\$0	\$14,273	\$14,273	\$0	\$14,273	\$14,273
6	\$200,723	\$69,854	\$0	\$0	\$270,577	\$0	\$14,559	\$14,559	\$0	\$14,559	\$14,559
7	\$204,738	\$71,530	\$0	\$0	\$276,268	\$0	\$14,850	\$14,850	\$0	\$14,850	\$14,850
8	\$208,832	\$73,247	\$0	\$0	\$282,080	\$0	\$15,147	\$15,147	\$0	\$15,147	\$15,147
9	\$213,009	\$75,005	\$0	\$0	\$288,014	\$0	\$15,450	\$15,450	\$0	\$15,450	\$15,450
10	\$217,269	\$76,805	\$0	\$0	\$294,074	\$0	\$15,759	\$15,759	\$0	\$15,759	\$15,759
11	\$221,615	\$78,649	\$0	\$0	\$300,263	\$0	\$16,074	\$16,074	\$0	\$16,074	\$16,074
12	\$226,047	\$80,536	\$0	\$0	\$306,583	\$0	\$16,395	\$16,395	\$0	\$16,395	\$16,395
13	\$230,568	\$82,469	\$0	\$0	\$313,037	\$0	\$16,723	\$16,723	\$0	\$16,723	\$16,723
14	\$235,179	\$84,448	\$0	\$0	\$319,627	\$0	\$17,058	\$17,058	\$0	\$17,058	\$17,058
15	\$239,883	\$86,475	\$0	\$0	\$326,358	\$0	\$17,399	\$17,399	\$0	\$17,399	\$17,399
16	\$244,680	\$88,550	\$0	\$0	\$333,231	\$0	\$17,747	\$17,747	\$0	\$17,747	\$17,747
17	\$249,574	\$90,676	\$0	\$0	\$340,250	\$0	\$18,102	\$18,102	\$0	\$18,102	\$18,102
18	\$254,566	\$92,852	\$0	\$0	\$347,417	\$0	\$18,464	\$18,464	\$0	\$18,464	\$18,464
19	\$259,657	\$95,080	\$0	\$0	\$354,737	\$0	\$18,833	\$18,833	\$0	\$18,833	\$18,833
20	\$264,850	\$97,362	\$0	\$0	\$362,212	\$0	\$19,210	\$19,210	\$0	\$19,210	\$19,210
21	\$225,123	\$63,082	\$0	\$0	\$308,205	\$0	\$16,328	\$16,328	\$0	\$16,328	\$16,328
22	\$183,700	\$68,061	\$0	\$0	\$251,761	\$0	\$13,324	\$13,324	\$0	\$13,324	\$13,324
23	\$93,687	\$34,847	\$0	\$0	\$128,534	\$0	\$6,795	\$6,795	\$0	\$6,795	\$6,795
Totals	\$4,581,626	\$1,639,252	\$0	\$0	\$6,220,878	\$0	\$332,308	\$332,308	\$0	\$332,308	\$332,308

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Rates	Cumulative Participants	Cumulative Free Rates	Cumulative Participants (Net/Ineligible)	Cumulative Participants (Net/Ineligible)	One-Time Investment	Annual Investment	Total Costs
1	750	0	750	0	750	750	\$18,750	\$0	\$18,750
2	750	0	1500	0	1500	1500	\$18,750	\$0	\$18,750
3	750	0	2250	0	2250	2250	\$18,750	\$0	\$18,750
4	750	0	3000	0	3000	3000	\$18,750	\$0	\$18,750
5	0	0	3000	0	3000	3000	\$0	\$0	\$0
6	0	0	3000	0	3000	3000	\$0	\$0	\$0
7	0	0	3000	0	3000	3000	\$0	\$0	\$0
8	0	0	3000	0	3000	3000	\$0	\$0	\$0
9	0	0	3000	0	3000	3000	\$0	\$0	\$0
10	0	0	3000	0	3000	3000	\$0	\$0	\$0
11	0	0	3000	0	3000	3000	\$0	\$0	\$0
12	0	0	3000	0	3000	3000	\$0	\$0	\$0
13	0	0	3000	0	3000	3000	\$0	\$0	\$0
14	0	0	3000	0	3000	3000	\$0	\$0	\$0
15	0	0	3000	0	3000	3000	\$0	\$0	\$0
16	0	0	2250	0	2250	2250	\$0	\$0	\$0
17	0	0	1500	0	1500	1500	\$0	\$0	\$0
18	0	0	750	0	750	750	\$0	\$0	\$0
Totals	3000	0	45000	0	45000	45000	\$75,000	\$0	\$75,000

Impacts and Savings																								
Year	Electric Impacts/Savings										Gas Impacts/Savings													
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)													
CO2 (lb)	kWh (kWh)	Summer Coin (kW)	Summer Coin (kW)	Winter Coin (kW)	Winter Coin (kW)	CO2 (lb)	kWh (kWh)	Summer Coin (kW)	Summer Coin (kW)	Winter Coin (kW)	Winter Coin (kW)	CO2 (lb)	CO2 (lb)	CO2 (lb)	CO2 (lb)	CO2 (lb)	CO2 (lb)	CO2 (lb)	CO2 (lb)					
1	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	311	311	295	295	141	141	887,591	887,591	105	105	78,533	78,533				
2	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	622	622	589	589	283	283	1,975,182	1,975,182	105	105	157,066	157,066				
3	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	934	934	884	884	424	424	2,962,773	2,962,773	105	105	235,598	235,598				
4	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	105	105	314,131	314,131				
5	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
6	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
7	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
8	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
9	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
10	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
11	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
12	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
13	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
14	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
15	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	1,245	1,245	1,179	1,179	566	566	3,950,365	3,950,365	0	0	0	0				
16	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	622	622	589	589	283	283	1,975,182	1,975,182	0	0	0	0				
17	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	311	311	295	295	141	141	887,591	887,591	0	0	0	0				
18	0.4	0.4	0.4	0.4	0.2	0.2	1,317	1,317	311	311	295	295	141	141	887,591	887,591	0	0	0	0				
Totals							23,702	23,702					59,255,469	59,255,469			3,950,365	3,950,365	1,885	1,885	4,711,966	4,711,966	314,131	314,131

Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant
1	\$99	\$153	\$252	\$73,981	\$99,786	\$173,767	\$73,981	\$48,546	\$122,527
2	\$101	\$136	\$236	\$150,922	\$203,563	\$354,485	\$150,922	\$97,091	\$248,013
3	\$103	\$138	\$241	\$230,911	\$311,451	\$542,362	\$230,911	\$145,637	\$376,547
4	\$105	\$141	\$246	\$314,638	\$423,374	\$737,912	\$314,638	\$194,182	\$509,221
5	\$107	\$144	\$251	\$320,319	\$432,045	\$752,364	\$320,319	\$194,182	\$514,502
6	\$109	\$147	\$256	\$326,726	\$440,686	\$767,412	\$326,726	\$194,182	\$520,308
7	\$111	\$150	\$261	\$333,260	\$449,500	\$782,760	\$333,260	\$194,182	\$527,443
8	\$113	\$153	\$266	\$339,925	\$458,490	\$798,415	\$339,925	\$194,182	\$534,108
9	\$116	\$156	\$271	\$346,724	\$467,659	\$814,383	\$346,724	\$194,182	\$540,906
10	\$118	\$159	\$277	\$353,658	\$477,013	\$830,671	\$353,658	\$194,182	\$547,841
11	\$120	\$162	\$282	\$360,731	\$486,563	\$847,284	\$360,731	\$194,182	\$554,914
12	\$123	\$165	\$288	\$367,946	\$496,284	\$864,230	\$367,946	\$194,182	\$562,128
13	\$125	\$169	\$294	\$375,305	\$506,210	\$881,515	\$375,305	\$194,182	\$569,487
14	\$128	\$172	\$300	\$382,811	\$516,334	\$899,145	\$382,811	\$194,182	\$576,994
15	\$130	\$176	\$306	\$390,467	\$526,660	\$917,126	\$390,467	\$194,182	\$584,650
16	\$133	\$179	\$312	\$398,268	\$537,695	\$935,361	\$398,268	\$194,182	\$592,444
17	\$135	\$183	\$318	\$406,211	\$548,439	\$953,950	\$406,211	\$194,182	\$600,362
18	\$138	\$186	\$324	\$414,392	\$559,874	\$972,824	\$414,392	\$194,182	\$608,492
Totals	\$2,112	\$2,849	\$4,961	\$5,273,147	\$7,112,394	\$12,385,540	\$5,273,147	\$2,912,735	\$8,185,882

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CO ₂ Saved						
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)	
1	\$217,671	\$415,398	\$0	\$0	\$633,069	\$1,452	\$1,452	\$1	\$1	\$8	\$8
2	\$222,752	\$422,875	\$0	\$0	\$645,627	\$740	\$740	\$0	\$0	\$4	\$4
3	\$227,968	\$430,456	\$0	\$0	\$658,424	\$503	\$503	\$0	\$0	\$3	\$3
4	\$233,315	\$438,235	\$0	\$0	\$671,550	\$385	\$385	\$0	\$0	\$2	\$2
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$901,704	\$1,706,994	\$0	\$0	\$2,608,698	\$3,080	\$3,080	\$1	\$1	\$17	\$17

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Admin/Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$54,346	\$29,450	\$0	\$0	\$83,796	\$0	\$52,829	\$52,829	\$0	\$52,829
2	\$112,171	\$60,785	\$0	\$0	\$172,955	\$0	\$109,672	\$109,672	\$0	\$109,672
3	\$173,640	\$94,065	\$0	\$0	\$267,705	\$0	\$170,759	\$170,759	\$0	\$170,759
4	\$238,929	\$129,475	\$0	\$0	\$368,403	\$0	\$236,331	\$236,331	\$0	\$236,331
5	\$246,575	\$133,818	\$0	\$0	\$380,392	\$0	\$245,312	\$245,312	\$0	\$245,312
6	\$254,465	\$137,893	\$0	\$0	\$392,358	\$0	\$254,633	\$254,633	\$0	\$254,633
7	\$262,608	\$142,306	\$0	\$0	\$404,914	\$0	\$264,309	\$264,309	\$0	\$264,309
8	\$271,011	\$146,860	\$0	\$0	\$417,871	\$0	\$274,353	\$274,353	\$0	\$274,353
9	\$279,684	\$151,559	\$0	\$0	\$431,243	\$0	\$284,779	\$284,779	\$0	\$284,779
10	\$288,634	\$156,409	\$0	\$0	\$445,043	\$0	\$295,600	\$295,600	\$0	\$295,600
11	\$297,870	\$161,414	\$0	\$0	\$459,284	\$0	\$306,833	\$306,833	\$0	\$306,833
12	\$307,402	\$166,580	\$0	\$0	\$473,981	\$0	\$318,493	\$318,493	\$0	\$318,493
13	\$317,238	\$171,910	\$0	\$0	\$489,149	\$0	\$330,595	\$330,595	\$0	\$330,595
14	\$327,390	\$177,411	\$0	\$0	\$504,801	\$0	\$343,158	\$343,158	\$0	\$343,158
15	\$337,867	\$183,088	\$0	\$0	\$520,955	\$0	\$356,198	\$356,198	\$0	\$356,198
16	\$281,509	\$141,710	\$0	\$0	\$423,219	\$0	\$277,300	\$277,300	\$0	\$277,300
17	\$179,918	\$97,497	\$0	\$0	\$277,415	\$0	\$191,892	\$191,892	\$0	\$191,892
18	\$92,838	\$50,308	\$0	\$0	\$143,146	\$0	\$99,592	\$99,592	\$0	\$99,592
Totals	\$4,304,092	\$2,332,370	\$0	\$0	\$6,636,462	\$0	\$4,412,639	\$4,412,639	\$0	\$4,412,639

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$54,346	\$29,450	\$0	\$0	\$83,796	\$0	\$52,829	\$52,829	\$0	\$52,829
2	\$112,171	\$60,785	\$0	\$0	\$172,955	\$0	\$109,672	\$109,672	\$0	\$109,672
3	\$173,640	\$94,065	\$0	\$0	\$267,705	\$0	\$170,759	\$170,759	\$0	\$170,759
4	\$238,929	\$129,475	\$0	\$0	\$368,403	\$0	\$236,331	\$236,331	\$0	\$236,331
5	\$246,575	\$133,818	\$0	\$0	\$380,392	\$0	\$245,312	\$245,312	\$0	\$245,312
6	\$254,465	\$137,893	\$0	\$0	\$392,358	\$0	\$254,633	\$254,633	\$0	\$254,633
7	\$262,608	\$142,306	\$0	\$0	\$404,914	\$0	\$264,309	\$264,309	\$0	\$264,309
8	\$271,011	\$146,860	\$0	\$0	\$417,871	\$0	\$274,353	\$274,353	\$0	\$274,353
9	\$279,684	\$151,559	\$0	\$0	\$431,243	\$0	\$284,779	\$284,779	\$0	\$284,779
10	\$288,634	\$156,409	\$0	\$0	\$445,043	\$0	\$295,600	\$295,600	\$0	\$295,600
11	\$297,870	\$161,414	\$0	\$0	\$459,284	\$0	\$306,833	\$306,833	\$0	\$306,833
12	\$307,402	\$166,580	\$0	\$0	\$473,981	\$0	\$318,493	\$318,493	\$0	\$318,493
13	\$317,238	\$171,910	\$0	\$0	\$489,149	\$0	\$330,595	\$330,595	\$0	\$330,595
14	\$327,390	\$177,411	\$0	\$0	\$504,801	\$0	\$343,158	\$343,158	\$0	\$343,158
15	\$337,867	\$183,088	\$0	\$0	\$520,955	\$0	\$356,198	\$356,198	\$0	\$356,198
16	\$281,509	\$141,710	\$0	\$0	\$423,219	\$0	\$277,300	\$277,300	\$0	\$277,300
17	\$179,918	\$97,497	\$0	\$0	\$277,415	\$0	\$191,892	\$191,892	\$0	\$191,892
18	\$92,838	\$50,308	\$0	\$0	\$143,146	\$0	\$99,592	\$99,592	\$0	\$99,592
Totals	\$4,304,092	\$2,332,370	\$0	\$0	\$6,636,462	\$0	\$4,412,639	\$4,412,639	\$0	\$4,412,639

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	200	0	200	0	200	200	\$305,000	\$0	\$305,000
2	200	0	400	0	400	400	\$305,000	\$0	\$305,000
3	200	0	600	0	600	600	\$305,000	\$0	\$305,000
4	200	0	800	0	800	800	\$305,000	\$0	\$305,000
5	0	0	800	0	800	800	\$0	\$0	\$0
6	0	0	800	0	800	800	\$0	\$0	\$0
7	0	0	800	0	800	800	\$0	\$0	\$0
8	0	0	800	0	800	800	\$0	\$0	\$0
9	0	0	800	0	800	800	\$0	\$0	\$0
10	0	0	800	0	800	800	\$0	\$0	\$0
11	0	0	800	0	800	800	\$0	\$0	\$0
12	0	0	800	0	800	800	\$0	\$0	\$0
13	0	0	800	0	800	800	\$0	\$0	\$0
14	0	0	800	0	800	800	\$0	\$0	\$0
15	0	0	800	0	800	800	\$0	\$0	\$0
16	0	0	600	0	600	600	\$0	\$0	\$0
17	0	0	400	0	400	400	\$0	\$0	\$0
18	0	0	200	0	200	200	\$0	\$0	\$0
Totals	800	0	12000	0	12000	12000	\$1,220,000	\$0	\$1,220,000

Impacts and Savings																								
Year	Per Participant						Electric Impacts/Savings										Gas Impacts/Savings							
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)		
1	0.8	0.8	0.8	0.8	0.4	2,634	2,634	166	157	157	75	526,715	526,715	166	157	157	75	526,715	526,715	209	209	41,884	41,884	
2	0.8	0.8	0.8	0.8	0.4	2,634	2,634	332	332	314	314	151	1,053,431	1,053,431	166	157	157	75	526,715	526,715	209	209	83,768	83,768
3	0.8	0.8	0.8	0.8	0.4	2,634	2,634	498	498	472	472	226	1,580,146	1,580,146	166	157	157	75	526,715	526,715	209	209	125,652	125,652
4	0.8	0.8	0.8	0.8	0.4	2,634	2,634	664	664	629	629	302	2,106,861	2,106,861	166	157	157	75	526,715	526,715	209	209	167,537	167,537
5	0.8	0.8	0.8	0.8	0.4	2,634	2,634	830	830	795	795	376	2,652,292	2,652,292	0	0	0	0	0	0	209	209	167,537	167,537
6	0.8	0.8	0.8	0.8	0.4	2,634	2,634	996	996	961	961	450	3,197,723	3,197,723	0	0	0	0	0	0	209	209	167,537	167,537
7	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,162	1,162	1,127	1,127	524	3,743,154	3,743,154	0	0	0	0	0	0	209	209	167,537	167,537
8	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,328	1,328	1,293	1,293	598	4,288,585	4,288,585	0	0	0	0	0	0	209	209	167,537	167,537
9	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,494	1,494	1,459	1,459	672	4,834,016	4,834,016	0	0	0	0	0	0	209	209	167,537	167,537
10	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,660	1,660	1,625	1,625	746	5,379,447	5,379,447	0	0	0	0	0	0	209	209	167,537	167,537
11	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,826	1,826	1,791	1,791	820	5,924,878	5,924,878	0	0	0	0	0	0	209	209	167,537	167,537
12	0.8	0.8	0.8	0.8	0.4	2,634	2,634	1,992	1,992	1,957	1,957	894	6,470,309	6,470,309	0	0	0	0	0	0	209	209	167,537	167,537
13	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,158	2,158	2,123	2,123	968	7,015,740	7,015,740	0	0	0	0	0	0	209	209	167,537	167,537
14	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,324	2,324	2,289	2,289	1,042	7,561,171	7,561,171	0	0	0	0	0	0	209	209	167,537	167,537
15	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,490	2,490	2,455	2,455	1,116	8,106,602	8,106,602	0	0	0	0	0	0	209	209	167,537	167,537
16	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,656	2,656	2,621	2,621	1,190	8,652,033	8,652,033	0	0	0	0	0	0	209	209	167,537	167,537
17	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,822	2,822	2,787	2,787	1,264	9,197,464	9,197,464	0	0	0	0	0	0	209	209	167,537	167,537
18	0.8	0.8	0.8	0.8	0.4	2,634	2,634	2,988	2,988	2,953	2,953	1,338	9,742,895	9,742,895	0	0	0	0	0	0	209	209	167,537	167,537
Totals																								

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Total
1	\$197	\$266	\$463	\$39,457	\$53,219	\$92,676	\$39,457	\$25,891	\$65,348
2	\$201	\$271	\$473	\$80,492	\$108,967	\$189,059	\$80,492	\$51,782	\$132,274
3	\$205	\$277	\$482	\$123,192	\$166,107	\$289,290	\$123,192	\$77,673	\$200,865
4	\$209	\$282	\$492	\$167,487	\$225,906	\$393,393	\$167,487	\$103,564	\$271,051
5	\$214	\$288	\$502	\$170,837	\$230,424	\$401,261	\$170,837	\$103,564	\$274,401
6	\$218	\$294	\$512	\$174,254	\$235,032	\$409,286	\$174,254	\$103,564	\$277,810
7	\$222	\$300	\$522	\$177,739	\$239,733	\$417,472	\$177,739	\$103,564	\$281,303
8	\$227	\$306	\$532	\$181,294	\$244,528	\$425,817	\$181,294	\$103,564	\$284,857
9	\$231	\$312	\$543	\$184,919	\$249,418	\$434,338	\$184,919	\$103,564	\$288,483
10	\$236	\$318	\$554	\$188,618	\$254,407	\$443,024	\$188,618	\$103,564	\$292,182
11	\$240	\$324	\$565	\$192,390	\$259,495	\$451,885	\$192,390	\$103,564	\$295,954
12	\$245	\$331	\$576	\$196,238	\$264,685	\$460,923	\$196,238	\$103,564	\$299,802
13	\$250	\$337	\$588	\$200,163	\$269,978	\$470,141	\$200,163	\$103,564	\$303,727
14	\$255	\$344	\$599	\$204,166	\$275,378	\$479,544	\$204,166	\$103,564	\$307,730
15	\$260	\$351	\$611	\$208,249	\$280,886	\$489,135	\$208,249	\$103,564	\$311,813
16	\$266	\$358	\$624	\$212,407	\$286,501	\$498,911	\$212,407	\$103,564	\$315,977
17	\$271	\$365	\$636	\$216,631	\$292,224	\$508,875	\$216,631	\$103,564	\$320,211
18	\$276	\$373	\$649	\$220,929	\$298,163	\$519,032	\$220,929	\$103,564	\$324,516
Totals	\$4,224	\$5,698	\$9,922	\$2,812,345	\$3,793,277	\$6,605,621	\$2,812,345	\$1,553,459	\$4,365,804

Utility Program Costs											
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF	
1	\$58,046	\$163,522	\$100,000	\$0	\$321,567	\$1,382	\$1,382	\$1	\$1	\$8	\$8
2	\$59,401	\$166,465	\$100,000	\$0	\$325,866	\$700	\$700	\$0	\$0	\$4	\$4
3	\$60,791	\$169,461	\$100,000	\$0	\$330,252	\$473	\$473	\$0	\$0	\$3	\$3
4	\$62,217	\$172,512	\$100,000	\$0	\$334,729	\$360	\$360	\$0	\$0	\$2	\$2
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$240,454	\$671,959	\$400,000	\$0	\$1,312,414	\$2,916	\$2,916	\$1	\$1	\$16	\$16

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total		
1	\$28,985	\$15,707	\$0	\$0	\$44,691	\$0	\$28,175	\$28,175		
2	\$59,824	\$32,419	\$0	\$0	\$92,243	\$0	\$58,492	\$58,492		
3	\$92,608	\$50,184	\$0	\$0	\$142,792	\$0	\$91,072	\$91,072		
4	\$127,429	\$69,063	\$0	\$0	\$196,492	\$0	\$126,043	\$126,043		
5	\$131,506	\$71,263	\$0	\$0	\$202,769	\$0	\$130,833	\$130,833		
6	\$135,715	\$73,543	\$0	\$0	\$209,258	\$0	\$135,804	\$135,804		
7	\$140,058	\$75,897	\$0	\$0	\$215,954	\$0	\$140,965	\$140,965		
8	\$144,539	\$78,325	\$0	\$0	\$222,865	\$0	\$146,322	\$146,322		
9	\$149,165	\$80,832	\$0	\$0	\$229,996	\$0	\$151,882	\$151,882		
10	\$153,938	\$83,418	\$0	\$0	\$237,356	\$0	\$157,653	\$157,653		
11	\$158,864	\$86,088	\$0	\$0	\$244,952	\$0	\$163,644	\$163,644		
12	\$163,948	\$88,842	\$0	\$0	\$252,790	\$0	\$169,863	\$169,863		
13	\$169,194	\$91,686	\$0	\$0	\$260,879	\$0	\$176,318	\$176,318		
14	\$174,608	\$94,619	\$0	\$0	\$269,227	\$0	\$183,018	\$183,018		
15	\$180,196	\$97,647	\$0	\$0	\$277,843	\$0	\$189,972	\$189,972		
16	\$186,971	\$75,579	\$0	\$0	\$215,050	\$0	\$147,893	\$147,893		
17	\$95,956	\$51,998	\$0	\$0	\$147,955	\$0	\$102,342	\$102,342		
18	\$49,513	\$26,831	\$0	\$0	\$76,345	\$0	\$53,116	\$53,116		
Totals	\$2,295,516	\$1,243,931	\$0	\$0	\$3,539,447	\$0	\$2,353,407	\$2,353,407		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Ancillary	Total	Gas Distribution	Gas Fuel	Total		
1	\$28,985	\$15,707	\$0	\$0	\$44,691	\$0	\$28,175	\$28,175		
2	\$59,824	\$32,419	\$0	\$0	\$92,243	\$0	\$58,492	\$58,492		
3	\$92,608	\$50,184	\$0	\$0	\$142,792	\$0	\$91,072	\$91,072		
4	\$127,429	\$69,063	\$0	\$0	\$196,492	\$0	\$126,043	\$126,043		
5	\$131,506	\$71,263	\$0	\$0	\$202,769	\$0	\$130,833	\$130,833		
6	\$135,715	\$73,543	\$0	\$0	\$209,258	\$0	\$135,804	\$135,804		
7	\$140,058	\$75,897	\$0	\$0	\$215,954	\$0	\$140,965	\$140,965		
8	\$144,539	\$78,325	\$0	\$0	\$222,865	\$0	\$146,322	\$146,322		
9	\$149,165	\$80,832	\$0	\$0	\$229,996	\$0	\$151,882	\$151,882		
10	\$153,938	\$83,418	\$0	\$0	\$237,356	\$0	\$157,653	\$157,653		
11	\$158,864	\$86,088	\$0	\$0	\$244,952	\$0	\$163,644	\$163,644		
12	\$163,948	\$88,842	\$0	\$0	\$252,790	\$0	\$169,863	\$169,863		
13	\$169,194	\$91,686	\$0	\$0	\$260,879	\$0	\$176,318	\$176,318		
14	\$174,608	\$94,619	\$0	\$0	\$269,227	\$0	\$183,018	\$183,018		
15	\$180,196	\$97,647	\$0	\$0	\$277,843	\$0	\$189,972	\$189,972		
16	\$186,971	\$75,579	\$0	\$0	\$215,050	\$0	\$147,893	\$147,893		
17	\$95,956	\$51,998	\$0	\$0	\$147,955	\$0	\$102,342	\$102,342		
18	\$49,513	\$26,831	\$0	\$0	\$76,345	\$0	\$53,116	\$53,116		
Totals	\$2,295,516	\$1,243,931	\$0	\$0	\$3,539,447	\$0	\$2,353,407	\$2,353,407		

Utility Program Costs											
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh/CCF	\$/CCF/kWh	
1	\$14,511	\$40,880	\$50,000	\$0	\$105,392	\$1,208	\$1,208	\$1	\$1	\$7	\$7
2	\$14,850	\$41,616	\$50,000	\$0	\$106,466	\$610	\$610	\$0	\$0	\$3	\$3
3	\$15,198	\$42,365	\$50,000	\$0	\$107,563	\$411	\$411	\$0	\$0	\$2	\$2
4	\$15,554	\$43,128	\$50,000	\$0	\$108,682	\$311	\$311	\$0	\$0	\$2	\$2
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$80,114	\$167,990	\$200,000	\$0	\$428,103	\$2,541	\$2,541	\$1	\$1	\$14	\$14

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$10,889	\$5,890	\$0	\$0	\$16,759	\$0	\$10,566	\$10,566		
2	\$22,434	\$12,157	\$0	\$0	\$34,591	\$0	\$21,934	\$21,934		
3	\$34,728	\$18,819	\$0	\$0	\$53,547	\$0	\$34,152	\$34,152		
4	\$47,786	\$26,895	\$0	\$0	\$73,681	\$0	\$47,266	\$47,266		
5	\$49,315	\$26,724	\$0	\$0	\$76,038	\$0	\$49,062	\$49,062		
6	\$50,893	\$27,579	\$0	\$0	\$78,472	\$0	\$50,927	\$50,927		
7	\$52,522	\$28,461	\$0	\$0	\$80,983	\$0	\$52,862	\$52,862		
8	\$54,202	\$29,372	\$0	\$0	\$83,574	\$0	\$54,871	\$54,871		
9	\$55,937	\$30,312	\$0	\$0	\$86,249	\$0	\$56,956	\$56,956		
10	\$57,727	\$31,282	\$0	\$0	\$89,009	\$0	\$59,120	\$59,120		
11	\$59,574	\$32,283	\$0	\$0	\$91,857	\$0	\$61,367	\$61,367		
12	\$61,480	\$33,316	\$0	\$0	\$94,796	\$0	\$63,699	\$63,699		
13	\$63,448	\$34,382	\$0	\$0	\$97,830	\$0	\$66,119	\$66,119		
14	\$65,478	\$35,482	\$0	\$0	\$100,960	\$0	\$68,632	\$68,632		
15	\$67,573	\$36,618	\$0	\$0	\$104,191	\$0	\$71,240	\$71,240		
16	\$69,732	\$37,792	\$0	\$0	\$106,524	\$0	\$73,932	\$73,932		
17	\$71,954	\$39,000	\$0	\$0	\$108,954	\$0	\$76,709	\$76,709		
18	\$74,238	\$40,242	\$0	\$0	\$112,480	\$0	\$79,571	\$79,571		
Totals	\$860,818	\$468,474	\$0	\$0	\$1,327,292	\$0	\$682,638	\$682,638		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$10,889	\$5,890	\$0	\$0	\$16,759	\$0	\$10,566	\$10,566		
2	\$22,434	\$12,157	\$0	\$0	\$34,591	\$0	\$21,934	\$21,934		
3	\$34,728	\$18,819	\$0	\$0	\$53,547	\$0	\$34,152	\$34,152		
4	\$47,786	\$26,895	\$0	\$0	\$73,681	\$0	\$47,266	\$47,266		
5	\$49,315	\$26,724	\$0	\$0	\$76,038	\$0	\$49,062	\$49,062		
6	\$50,893	\$27,579	\$0	\$0	\$78,472	\$0	\$50,927	\$50,927		
7	\$52,522	\$28,461	\$0	\$0	\$80,983	\$0	\$52,862	\$52,862		
8	\$54,202	\$29,372	\$0	\$0	\$83,574	\$0	\$54,871	\$54,871		
9	\$55,937	\$30,312	\$0	\$0	\$86,249	\$0	\$56,956	\$56,956		
10	\$57,727	\$31,282	\$0	\$0	\$89,009	\$0	\$59,120	\$59,120		
11	\$59,574	\$32,283	\$0	\$0	\$91,857	\$0	\$61,367	\$61,367		
12	\$61,480	\$33,316	\$0	\$0	\$94,796	\$0	\$63,699	\$63,699		
13	\$63,448	\$34,382	\$0	\$0	\$97,830	\$0	\$66,119	\$66,119		
14	\$65,478	\$35,482	\$0	\$0	\$100,960	\$0	\$68,632	\$68,632		
15	\$67,573	\$36,618	\$0	\$0	\$104,191	\$0	\$71,240	\$71,240		
16	\$69,732	\$37,792	\$0	\$0	\$106,524	\$0	\$73,932	\$73,932		
17	\$71,954	\$39,000	\$0	\$0	\$108,954	\$0	\$76,709	\$76,709		
18	\$74,238	\$40,242	\$0	\$0	\$112,480	\$0	\$79,571	\$79,571		
Totals	\$860,818	\$468,474	\$0	\$0	\$1,327,292	\$0	\$682,638	\$682,638		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	3000	0	3000	0	3000	3000	\$0	\$0	\$0
2	3000	0	6000	0	6000	6000	\$0	\$0	\$0
3	3000	0	9000	0	9000	9000	\$0	\$0	\$0
4	3000	0	12000	0	12000	12000	\$0	\$0	\$0
5	0	0	12000	0	12000	12000	\$0	\$0	\$0
6	0	0	12000	0	12000	12000	\$0	\$0	\$0
7	0	0	12000	0	12000	12000	\$0	\$0	\$0
8	0	0	12000	0	12000	12000	\$0	\$0	\$0
9	0	0	9000	0	9000	9000	\$0	\$0	\$0
10	0	0	6000	0	6000	6000	\$0	\$0	\$0
11	0	0	3000	0	3000	3000	\$0	\$0	\$0
Totals	12000	0	96000	0	96000	96000	\$0	\$0	\$0

Impacts and Savings																											
Electric Impacts/Savings										Gas Impacts/Savings																	
Year	Per Participant										Yearly Incremental (Per Participant * Incremental Participants)										Per Participant						
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh (est)	kWh (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh (est)	kWh (est)	kW	kWh (est)	CCF	CCF (est)	CCF	CCF (est)	CCF	CCF (est)	CCF	CCF (est)	
2	0.01	0.01	0.01	0.01	0.01	0.01	40	40	38	36	36	17	17	119,660	119,660	38	38	36	36	17	17	119,660	119,660	11	11	34,023	34,023
3	0.01	0.01	0.01	0.01	0.01	0.01	40	40	75	71	71	34	34	239,320	239,320	38	38	36	36	17	17	119,660	119,660	11	11	68,046	68,046
4	0.01	0.01	0.01	0.01	0.01	0.01	40	40	113	107	107	51	51	368,979	368,979	38	38	36	36	17	17	119,660	119,660	11	11	102,069	102,069
5	0.01	0.01	0.01	0.01	0.01	0.01	40	40	151	143	143	69	69	478,639	478,639	38	38	36	36	17	17	119,660	119,660	11	11	136,092	136,092
6	0.01	0.01	0.01	0.01	0.01	0.01	40	40	151	143	143	69	69	478,639	478,639	0	0	0	0	0	0	0	0	11	11	136,092	136,092
7	0.01	0.01	0.01	0.01	0.01	0.01	40	40	151	143	143	69	69	478,639	478,639	0	0	0	0	0	0	0	0	11	11	136,092	136,092
8	0.01	0.01	0.01	0.01	0.01	0.01	40	40	151	143	143	69	69	478,639	478,639	0	0	0	0	0	0	0	0	11	11	136,092	136,092
9	0.01	0.01	0.01	0.01	0.01	0.01	40	40	113	107	107	51	51	368,979	368,979	0	0	0	0	0	0	0	0	11	11	102,069	102,069
10	0.01	0.01	0.01	0.01	0.01	0.01	40	40	75	71	71	34	34	239,320	239,320	0	0	0	0	0	0	0	0	11	11	68,046	68,046
11	0.01	0.01	0.01	0.01	0.01	0.01	40	40	38	36	36	17	17	119,660	119,660	0	0	0	0	0	0	0	0	11	11	34,023	34,023
Totals							439	439				3,829,114	3,829,114				478,639	478,639	125	125	1,088,736	1,088,736	136,092	136,092			

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$3	\$14	\$17	\$8,964	\$43,230	\$52,194	\$8,964	\$21,032	\$29,995
2	\$3	\$15	\$18	\$18,296	\$88,190	\$106,476	\$18,296	\$42,063	\$60,349
3	\$3	\$15	\$18	\$27,878	\$134,531	\$162,209	\$27,878	\$63,095	\$91,073
4	\$3	\$15	\$18	\$38,050	\$183,508	\$221,556	\$38,050	\$84,126	\$122,176
5	\$3	\$16	\$19	\$38,811	\$187,176	\$225,987	\$38,811	\$84,126	\$122,937
6	\$3	\$16	\$19	\$38,687	\$186,920	\$225,507	\$38,687	\$84,126	\$123,713
7	\$3	\$16	\$20	\$40,379	\$194,738	\$235,117	\$40,379	\$84,126	\$124,505
8	\$3	\$17	\$20	\$41,186	\$198,633	\$239,819	\$41,186	\$84,126	\$125,313
9	\$4	\$17	\$20	\$31,508	\$151,954	\$183,462	\$31,508	\$63,095	\$94,602
10	\$4	\$17	\$21	\$21,425	\$103,329	\$124,754	\$21,425	\$42,063	\$63,488
11	\$4	\$18	\$21	\$10,927	\$52,698	\$63,625	\$10,927	\$21,032	\$31,968
Totals	\$36	\$175	\$212	\$317,101	\$1,529,305	\$1,846,406	\$317,101	\$675,010	\$990,111

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Hardware	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Saved	\$/CCF-Saved	
1	\$42,199	\$0	\$0	\$0	\$42,199	\$799	\$799	\$0	\$0	\$1	\$1
2	\$21,479	\$0	\$0	\$0	\$21,479	\$203	\$203	\$0	\$0	\$0	\$0
3	\$21,866	\$0	\$0	\$0	\$21,866	\$138	\$138	\$0	\$0	\$0	\$0
4	\$38,954	\$0	\$0	\$0	\$38,954	\$184	\$184	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$124,499	\$0	\$0	\$0	\$124,499	\$1,324	\$1,324	\$1	\$1	\$2	\$2

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario											
Year	Cumulative Electric					Cumulative Gas					
	Energy	Address Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$6,585	\$3,568	\$0	\$0	\$10,153	\$0	\$22,887	\$22,887	\$0	\$22,887	\$22,887
2	\$13,591	\$7,365	\$0	\$0	\$20,956	\$0	\$47,514	\$47,514	\$0	\$47,514	\$47,514
3	\$21,039	\$11,401	\$0	\$0	\$32,440	\$0	\$73,979	\$73,979	\$0	\$73,979	\$73,979
4	\$28,949	\$16,688	\$0	\$0	\$44,637	\$0	\$102,386	\$102,386	\$0	\$102,386	\$102,386
5	\$29,876	\$16,190	\$0	\$0	\$46,065	\$0	\$106,277	\$106,277	\$0	\$106,277	\$106,277
6	\$30,832	\$16,708	\$0	\$0	\$47,539	\$0	\$110,316	\$110,316	\$0	\$110,316	\$110,316
7	\$31,818	\$17,242	\$0	\$0	\$49,061	\$0	\$114,508	\$114,508	\$0	\$114,508	\$114,508
8	\$32,837	\$17,794	\$0	\$0	\$50,631	\$0	\$118,859	\$118,859	\$0	\$118,859	\$118,859
9	\$25,416	\$13,773	\$0	\$0	\$39,188	\$0	\$92,532	\$92,532	\$0	\$92,532	\$92,532
10	\$17,486	\$9,476	\$0	\$0	\$26,961	\$0	\$64,032	\$64,032	\$0	\$64,032	\$64,032
11	\$9,023	\$4,869	\$0	\$0	\$13,912	\$0	\$33,233	\$33,233	\$0	\$33,233	\$33,233
Totals	\$247,451	\$134,093	\$0	\$0	\$381,543	\$0	\$886,621	\$886,621	\$0	\$886,621	\$886,621

Cost-Based Avoided Costs (Net Free Riders/Persistence)											
Year	Cumulative Electric					Cumulative Gas					
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	Total
1	\$6,585	\$3,568	\$0	\$0	\$10,153	\$0	\$22,887	\$22,887	\$0	\$22,887	\$22,887
2	\$13,591	\$7,365	\$0	\$0	\$20,956	\$0	\$47,514	\$47,514	\$0	\$47,514	\$47,514
3	\$21,039	\$11,401	\$0	\$0	\$32,440	\$0	\$73,979	\$73,979	\$0	\$73,979	\$73,979
4	\$28,949	\$16,688	\$0	\$0	\$44,637	\$0	\$102,386	\$102,386	\$0	\$102,386	\$102,386
5	\$29,876	\$16,190	\$0	\$0	\$46,065	\$0	\$106,277	\$106,277	\$0	\$106,277	\$106,277
6	\$30,832	\$16,708	\$0	\$0	\$47,539	\$0	\$110,316	\$110,316	\$0	\$110,316	\$110,316
7	\$31,818	\$17,242	\$0	\$0	\$49,061	\$0	\$114,508	\$114,508	\$0	\$114,508	\$114,508
8	\$32,837	\$17,794	\$0	\$0	\$50,631	\$0	\$118,859	\$118,859	\$0	\$118,859	\$118,859
9	\$25,416	\$13,773	\$0	\$0	\$39,188	\$0	\$92,532	\$92,532	\$0	\$92,532	\$92,532
10	\$17,486	\$9,476	\$0	\$0	\$26,961	\$0	\$64,032	\$64,032	\$0	\$64,032	\$64,032
11	\$9,023	\$4,869	\$0	\$0	\$13,912	\$0	\$33,233	\$33,233	\$0	\$33,233	\$33,233
Totals	\$247,451	\$134,093	\$0	\$0	\$381,543	\$0	\$886,621	\$886,621	\$0	\$886,621	\$886,621

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ no participant)	One-Time Investment	Annual Investment	Total Costs
1	3000	0	3000	0	3000	3000	\$0	\$0	\$0
2	3000	0	6000	0	6000	6000	\$0	\$0	\$0
3	3000	0	9000	0	9000	9000	\$0	\$0	\$0
4	3000	0	12000	0	12000	12000	\$0	\$0	\$0
5	0	0	12000	0	12000	12000	\$0	\$0	\$0
6	0	0	12000	0	12000	12000	\$0	\$0	\$0
7	0	0	12000	0	12000	12000	\$0	\$0	\$0
8	0	0	9000	0	9000	9000	\$0	\$0	\$0
9	0	0	6000	0	6000	6000	\$0	\$0	\$0
10	0	0	3000	0	3000	3000	\$0	\$0	\$0
Totals	12000	0	84000	0	84000	84000	\$0	\$0	\$0

Impacts and Savings																																
Year	Electric Impacts/Savings																								Per Participant		Gas Impacts/Savings					
	Per Participant												Cumulative												Yearly Incremental (Per Participant * Incremental Participants)		Per Participant		Cumulative		Yearly Incremental	
	kWh	kWh (net)	Summer Con (kWh)	Summer Con (net)	Winter Con (kWh)	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)				
1	0.04	0.04	0.01	0.01	0.02	0.02	190	190	134	44	44	61	61	571,310	571,310	134	134	44	44	61	61	571,310	571,310	0	0	0	0					
2	0.04	0.04	0.01	0.01	0.02	0.02	190	190	267	88	88	123	123	1,142,620	1,142,620	134	134	44	44	61	61	571,310	571,310	0	0	0	0					
3	0.04	0.04	0.01	0.01	0.02	0.02	190	190	401	132	132	184	184	1,713,930	1,713,930	134	134	44	44	61	61	571,310	571,310	0	0	0	0					
4	0.04	0.04	0.01	0.01	0.02	0.02	190	190	535	176	176	246	246	2,285,239	2,285,239	134	134	44	44	61	61	571,310	571,310	0	0	0	0					
5	0.04	0.04	0.01	0.01	0.02	0.02	190	190	535	176	176	246	246	2,285,239	2,285,239	0	0	0	0	0	0	0	0	0	0	0	0					
6	0.04	0.04	0.01	0.01	0.02	0.02	190	190	535	176	176	246	246	2,285,239	2,285,239	0	0	0	0	0	0	0	0	0	0	0	0					
7	0.04	0.04	0.01	0.01	0.02	0.02	190	190	535	176	176	246	246	2,285,239	2,285,239	0	0	0	0	0	0	0	0	0	0	0	0					
8	0.04	0.04	0.01	0.01	0.02	0.02	190	190	401	132	132	184	184	1,713,930	1,713,930	0	0	0	0	0	0	0	0	0	0	0	0					
9	0.04	0.04	0.01	0.01	0.02	0.02	190	190	267	88	88	123	123	1,142,620	1,142,620	0	0	0	0	0	0	0	0	0	0	0	0					
10	0.04	0.04	0.01	0.01	0.02	0.02	190	190	134	44	44	61	61	571,310	571,310	0	0	0	0	0	0	0	0	0	0	0	0					
Totals							1,904	1,904						15,986,676	15,986,676							2,285,239	2,285,239	0	0	0	0					

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Total	Net Fuel Electric	Net Fuel Gas	Total
1	\$14	\$0	\$14	\$42,797	\$0	\$42,797	\$42,797	\$0	\$42,797
2	\$15	\$0	\$15	\$87,307	\$0	\$87,307	\$87,307	\$0	\$87,307
3	\$15	\$0	\$15	\$133,079	\$0	\$133,079	\$133,079	\$0	\$133,079
4	\$15	\$0	\$15	\$181,668	\$0	\$181,668	\$181,668	\$0	\$181,668
5	\$15	\$0	\$15	\$185,301	\$0	\$185,301	\$185,301	\$0	\$185,301
6	\$16	\$0	\$16	\$189,007	\$0	\$189,007	\$189,007	\$0	\$189,007
7	\$16	\$0	\$16	\$192,787	\$0	\$192,787	\$192,787	\$0	\$192,787
8	\$16	\$0	\$16	\$147,462	\$0	\$147,462	\$147,462	\$0	\$147,462
9	\$17	\$0	\$17	\$100,288	\$0	\$100,288	\$100,288	\$0	\$100,288
10	\$17	\$0	\$17	\$51,147	\$0	\$51,147	\$51,147	\$0	\$51,147
Totals	\$156	\$0	\$156	\$1,311,362	\$0	\$1,311,362	\$1,311,362	\$0	\$1,311,362

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Marketing	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF
1	\$0	\$25,319	\$0	\$0	\$25,319	\$240	\$240	\$0	\$0	\$0
2	\$0	\$25,775	\$0	\$0	\$25,775	\$122	\$122	\$0	\$0	\$0
3	\$0	\$26,239	\$0	\$0	\$26,239	\$83	\$83	\$0	\$0	\$0
4	\$0	\$26,711	\$0	\$0	\$26,711	\$63	\$63	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$104,045	\$0	\$0	\$104,045	\$508	\$508	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Conduct	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$23,770	\$4,405	\$0	\$0	\$28,175	\$0	\$0	\$0		
2	\$49,061	\$9,092	\$0	\$0	\$58,153	\$0	\$0	\$0		
3	\$75,946	\$14,074	\$0	\$0	\$90,021	\$0	\$0	\$0		
4	\$104,502	\$19,366	\$0	\$0	\$123,868	\$0	\$0	\$0		
5	\$107,846	\$19,986	\$0	\$0	\$127,832	\$0	\$0	\$0		
6	\$111,298	\$20,625	\$0	\$0	\$131,923	\$0	\$0	\$0		
7	\$114,859	\$21,285	\$0	\$0	\$136,144	\$0	\$0	\$0		
8	\$88,901	\$16,475	\$0	\$0	\$105,376	\$0	\$0	\$0		
9	\$61,164	\$11,335	\$0	\$0	\$72,499	\$0	\$0	\$0		
10	\$31,561	\$5,849	\$0	\$0	\$37,409	\$0	\$0	\$0		
Totals	\$768,908	\$142,492	\$0	\$0	\$911,400	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Conduct	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$23,770	\$4,405	\$0	\$0	\$28,175	\$0	\$0	\$0		
2	\$49,061	\$9,092	\$0	\$0	\$58,153	\$0	\$0	\$0		
3	\$75,946	\$14,074	\$0	\$0	\$90,021	\$0	\$0	\$0		
4	\$104,502	\$19,366	\$0	\$0	\$123,868	\$0	\$0	\$0		
5	\$107,846	\$19,986	\$0	\$0	\$127,832	\$0	\$0	\$0		
6	\$111,298	\$20,625	\$0	\$0	\$131,923	\$0	\$0	\$0		
7	\$114,859	\$21,285	\$0	\$0	\$136,144	\$0	\$0	\$0		
8	\$88,901	\$16,475	\$0	\$0	\$105,376	\$0	\$0	\$0		
9	\$61,164	\$11,335	\$0	\$0	\$72,499	\$0	\$0	\$0		
10	\$31,561	\$5,849	\$0	\$0	\$37,409	\$0	\$0	\$0		
Totals	\$768,908	\$142,492	\$0	\$0	\$911,400	\$0	\$0	\$0		

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$217,671	\$415,398	\$0	\$0	\$633,069	\$1,022	\$1,022	\$1	\$1	\$0
2	\$222,752	\$422,875	\$0	\$0	\$645,627	\$521	\$521	\$0	\$0	\$0
3	\$227,966	\$430,486	\$0	\$0	\$658,452	\$354	\$354	\$0	\$0	\$0
4	\$233,315	\$438,235	\$0	\$0	\$671,550	\$271	\$271	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$901,704	\$1,706,994	\$0	\$0	\$2,608,698	\$2,168	\$2,168	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$61,438	\$28,326	\$0	\$0	\$89,764	\$0	\$0	\$0	\$0	\$0
2	\$126,808	\$58,464	\$0	\$0	\$185,272	\$0	\$0	\$0	\$0	\$0
3	\$196,298	\$90,503	\$0	\$0	\$286,801	\$0	\$0	\$0	\$0	\$0
4	\$270,106	\$124,532	\$0	\$0	\$394,638	\$0	\$0	\$0	\$0	\$0
5	\$278,750	\$128,517	\$0	\$0	\$407,266	\$0	\$0	\$0	\$0	\$0
6	\$287,670	\$132,629	\$0	\$0	\$420,299	\$0	\$0	\$0	\$0	\$0
7	\$296,875	\$136,874	\$0	\$0	\$433,749	\$0	\$0	\$0	\$0	\$0
8	\$306,375	\$141,253	\$0	\$0	\$447,628	\$0	\$0	\$0	\$0	\$0
9	\$316,179	\$145,774	\$0	\$0	\$461,953	\$0	\$0	\$0	\$0	\$0
10	\$326,297	\$150,438	\$0	\$0	\$476,735	\$0	\$0	\$0	\$0	\$0
11	\$336,738	\$155,252	\$0	\$0	\$491,991	\$0	\$0	\$0	\$0	\$0
12	\$347,514	\$160,220	\$0	\$0	\$507,734	\$0	\$0	\$0	\$0	\$0
13	\$358,634	\$165,348	\$0	\$0	\$523,982	\$0	\$0	\$0	\$0	\$0
14	\$370,111	\$170,639	\$0	\$0	\$540,749	\$0	\$0	\$0	\$0	\$0
15	\$381,954	\$176,099	\$0	\$0	\$558,053	\$0	\$0	\$0	\$0	\$0
16	\$395,632	\$181,301	\$0	\$0	\$576,933	\$0	\$0	\$0	\$0	\$0
17	\$403,395	\$93,775	\$0	\$0	\$297,170	\$0	\$0	\$0	\$0	\$0
18	\$104,952	\$48,388	\$0	\$0	\$153,340	\$0	\$0	\$0	\$0	\$0
Totals	\$4,865,725	\$2,243,331	\$0	\$0	\$7,109,057	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$61,438	\$28,326	\$0	\$0	\$89,764	\$0	\$0	\$0	\$0	\$0
2	\$126,808	\$58,464	\$0	\$0	\$185,272	\$0	\$0	\$0	\$0	\$0
3	\$196,298	\$90,503	\$0	\$0	\$286,801	\$0	\$0	\$0	\$0	\$0
4	\$270,106	\$124,532	\$0	\$0	\$394,638	\$0	\$0	\$0	\$0	\$0
5	\$278,750	\$128,517	\$0	\$0	\$407,266	\$0	\$0	\$0	\$0	\$0
6	\$287,670	\$132,629	\$0	\$0	\$420,299	\$0	\$0	\$0	\$0	\$0
7	\$296,875	\$136,874	\$0	\$0	\$433,749	\$0	\$0	\$0	\$0	\$0
8	\$306,375	\$141,253	\$0	\$0	\$447,628	\$0	\$0	\$0	\$0	\$0
9	\$316,179	\$145,774	\$0	\$0	\$461,953	\$0	\$0	\$0	\$0	\$0
10	\$326,297	\$150,438	\$0	\$0	\$476,735	\$0	\$0	\$0	\$0	\$0
11	\$336,738	\$155,252	\$0	\$0	\$491,991	\$0	\$0	\$0	\$0	\$0
12	\$347,514	\$160,220	\$0	\$0	\$507,734	\$0	\$0	\$0	\$0	\$0
13	\$358,634	\$165,348	\$0	\$0	\$523,982	\$0	\$0	\$0	\$0	\$0
14	\$370,111	\$170,639	\$0	\$0	\$540,749	\$0	\$0	\$0	\$0	\$0
15	\$381,954	\$176,099	\$0	\$0	\$558,053	\$0	\$0	\$0	\$0	\$0
16	\$395,632	\$181,301	\$0	\$0	\$576,933	\$0	\$0	\$0	\$0	\$0
17	\$403,395	\$93,775	\$0	\$0	\$297,170	\$0	\$0	\$0	\$0	\$0
18	\$104,952	\$48,388	\$0	\$0	\$153,340	\$0	\$0	\$0	\$0	\$0
Totals	\$4,865,725	\$2,243,331	\$0	\$0	\$7,109,057	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs						
Year	Participation				Total Participant Costs	
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	One-Time Investment	Annual Investment
1	200	0	200	0	\$305,000	\$0
2	200	0	400	0	\$305,000	\$0
3	200	0	600	0	\$305,000	\$0
4	200	0	800	0	\$305,000	\$0
5	0	0	800	0	\$0	\$0
6	0	0	800	0	\$0	\$0
7	0	0	800	0	\$0	\$0
8	0	0	800	0	\$0	\$0
9	0	0	800	0	\$0	\$0
10	0	0	800	0	\$0	\$0
11	0	0	800	0	\$0	\$0
12	0	0	800	0	\$0	\$0
13	0	0	800	0	\$0	\$0
14	0	0	800	0	\$0	\$0
15	0	0	800	0	\$0	\$0
16	0	0	600	0	\$0	\$0
17	0	0	400	0	\$0	\$0
18	0	0	200	0	\$0	\$0
Totals	800	0	12000	0	\$1,220,000	\$0

Impacts and Savings																													
Year	kW	kW (net)	Electric Impacts/Savings														Gas Impacts/Savings												
			Per Participant		Cumulative												Yearly Incremental (Per Participant * Incremental Participants)					Per Participant		Cumulative			Yearly Incremental		
			Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	
1	1	1	1	1	1	3,292	3,292	203	151	179	179	658,369	658,369	203	203	151	151	179	179	658,369	658,369	0	0	0	0	0	0	0	0
2	1	1	1	1	1	3,292	3,292	406	406	302	302	359	359	1,316,737	1,316,737	203	203	151	151	179	179	658,369	658,369	0	0	0	0	0	0
3	1	1	1	1	1	3,292	3,292	610	610	454	454	538	538	1,975,106	1,975,106	203	203	151	151	179	179	658,369	658,369	0	0	0	0	0	0
4	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	203	203	151	151	179	179	658,369	658,369	0	0	0	0	0	0
5	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1	1	1	1	3,292	3,292	813	813	605	605	717	717	2,633,474	2,633,474	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	1	1	1	1	3,292	3,292	610	610	454	454	538	538	1,975,106	1,975,106	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	1	1	1	1	1	3,292	3,292	406	406	302	302	359	359	1,316,737	1,316,737	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1	1	1	1	1	3,292	3,292	203	203	151	151	179	179	658,369	658,369	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals						59,253	59,253							39,602,115	39,602,115														

Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$232	\$0	\$232	\$46,493	\$0	\$46,493	\$46,493	\$0	\$46,493
2	\$237	\$0	\$237	\$94,846	\$0	\$94,846	\$94,846	\$0	\$94,846
3	\$242	\$0	\$242	\$145,114	\$0	\$145,114	\$145,114	\$0	\$145,114
4	\$247	\$0	\$247	\$197,355	\$0	\$197,355	\$197,355	\$0	\$197,355
5	\$252	\$0	\$252	\$201,302	\$0	\$201,302	\$201,302	\$0	\$201,302
6	\$257	\$0	\$257	\$205,328	\$0	\$205,328	\$205,328	\$0	\$205,328
7	\$262	\$0	\$262	\$209,435	\$0	\$209,435	\$209,435	\$0	\$209,435
8	\$267	\$0	\$267	\$213,624	\$0	\$213,624	\$213,624	\$0	\$213,624
9	\$272	\$0	\$272	\$217,896	\$0	\$217,896	\$217,896	\$0	\$217,896
10	\$278	\$0	\$278	\$222,254	\$0	\$222,254	\$222,254	\$0	\$222,254
11	\$283	\$0	\$283	\$226,699	\$0	\$226,699	\$226,699	\$0	\$226,699
12	\$289	\$0	\$289	\$231,233	\$0	\$231,233	\$231,233	\$0	\$231,233
13	\$296	\$0	\$296	\$235,858	\$0	\$235,858	\$235,858	\$0	\$235,858
14	\$301	\$0	\$301	\$240,575	\$0	\$240,575	\$240,575	\$0	\$240,575
15	\$307	\$0	\$307	\$245,386	\$0	\$245,386	\$245,386	\$0	\$245,386
16	\$313	\$0	\$313	\$187,721	\$0	\$187,721	\$187,721	\$0	\$187,721
17	\$319	\$0	\$319	\$127,650	\$0	\$127,650	\$127,650	\$0	\$127,650
18	\$326	\$0	\$326	\$65,101	\$0	\$65,101	\$65,101	\$0	\$65,101
Totals	\$4,978	\$0	\$4,978	\$3,313,870	\$0	\$3,313,870	\$3,313,870	\$0	\$3,313,870

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$58,046	\$163,522	\$100,000	\$0	\$321,567	\$973	\$973	\$0	\$0	\$0
2	\$59,431	\$166,465	\$100,000	\$0	\$325,896	\$493	\$493	\$0	\$0	\$0
3	\$60,791	\$169,461	\$100,000	\$0	\$330,252	\$333	\$333	\$0	\$0	\$0
4	\$62,217	\$172,512	\$100,000	\$0	\$334,729	\$253	\$253	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$340,454	\$671,959	\$400,000	\$0	\$1,312,414	\$2,052	\$2,052	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$32,767	\$15,107	\$0	\$0	\$47,874	\$0	\$0	\$0		
2	\$67,631	\$31,181	\$0	\$0	\$98,812	\$0	\$0	\$0		
3	\$104,692	\$46,268	\$0	\$0	\$150,960	\$0	\$0	\$0		
4	\$144,657	\$66,417	\$0	\$0	\$210,474	\$0	\$0	\$0		
5	\$148,666	\$68,542	\$0	\$0	\$217,209	\$0	\$0	\$0		
6	\$153,424	\$70,736	\$0	\$0	\$224,159	\$0	\$0	\$0		
7	\$158,333	\$72,999	\$0	\$0	\$231,333	\$0	\$0	\$0		
8	\$163,400	\$75,335	\$0	\$0	\$238,735	\$0	\$0	\$0		
9	\$168,629	\$77,746	\$0	\$0	\$246,375	\$0	\$0	\$0		
10	\$174,025	\$80,234	\$0	\$0	\$254,259	\$0	\$0	\$0		
11	\$179,594	\$82,801	\$0	\$0	\$262,395	\$0	\$0	\$0		
12	\$185,341	\$85,451	\$0	\$0	\$270,792	\$0	\$0	\$0		
13	\$191,272	\$88,185	\$0	\$0	\$279,457	\$0	\$0	\$0		
14	\$197,392	\$91,007	\$0	\$0	\$288,400	\$0	\$0	\$0		
15	\$203,709	\$93,920	\$0	\$0	\$297,628	\$0	\$0	\$0		
16	\$157,671	\$72,694	\$0	\$0	\$230,364	\$0	\$0	\$0		
17	\$108,477	\$50,013	\$0	\$0	\$158,491	\$0	\$0	\$0		
18	\$55,974	\$25,807	\$0	\$0	\$81,781	\$0	\$0	\$0		
Totals	\$2,595,053	\$1,196,443	\$0	\$0	\$3,791,497	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$32,767	\$15,107	\$0	\$0	\$47,874	\$0	\$0	\$0		
2	\$67,631	\$31,181	\$0	\$0	\$98,812	\$0	\$0	\$0		
3	\$104,692	\$46,268	\$0	\$0	\$150,960	\$0	\$0	\$0		
4	\$144,657	\$66,417	\$0	\$0	\$210,474	\$0	\$0	\$0		
5	\$148,666	\$68,542	\$0	\$0	\$217,209	\$0	\$0	\$0		
6	\$153,424	\$70,736	\$0	\$0	\$224,159	\$0	\$0	\$0		
7	\$158,333	\$72,999	\$0	\$0	\$231,333	\$0	\$0	\$0		
8	\$163,400	\$75,335	\$0	\$0	\$238,735	\$0	\$0	\$0		
9	\$168,629	\$77,746	\$0	\$0	\$246,375	\$0	\$0	\$0		
10	\$174,025	\$80,234	\$0	\$0	\$254,259	\$0	\$0	\$0		
11	\$179,594	\$82,801	\$0	\$0	\$262,395	\$0	\$0	\$0		
12	\$185,341	\$85,451	\$0	\$0	\$270,792	\$0	\$0	\$0		
13	\$191,272	\$88,185	\$0	\$0	\$279,457	\$0	\$0	\$0		
14	\$197,392	\$91,007	\$0	\$0	\$288,400	\$0	\$0	\$0		
15	\$203,709	\$93,920	\$0	\$0	\$297,628	\$0	\$0	\$0		
16	\$157,671	\$72,694	\$0	\$0	\$230,364	\$0	\$0	\$0		
17	\$108,477	\$50,013	\$0	\$0	\$158,491	\$0	\$0	\$0		
18	\$55,974	\$25,807	\$0	\$0	\$81,781	\$0	\$0	\$0		
Totals	\$2,595,053	\$1,196,443	\$0	\$0	\$3,791,497	\$0	\$0	\$0		

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF	
1	\$14,511	\$40,880	\$50,000	\$0	\$105,392	\$850	\$850	\$0	\$0	\$0	
2	\$14,850	\$41,616	\$50,000	\$0	\$106,466	\$430	\$430	\$0	\$0	\$0	
3	\$15,198	\$42,365	\$50,000	\$0	\$107,563	\$289	\$289	\$0	\$0	\$0	
4	\$15,554	\$43,128	\$50,000	\$0	\$108,682	\$219	\$219	\$0	\$0	\$0	
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Totals	\$80,114	\$167,990	\$200,000	\$0	\$428,103	\$1,789	\$1,789	\$1	\$1	\$0	

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$12,288	\$5,665	\$0	\$0	\$17,953	\$0	\$0	\$0		
2	\$25,362	\$11,693	\$0	\$0	\$37,054	\$0	\$0	\$0		
3	\$38,260	\$18,101	\$0	\$0	\$57,360	\$0	\$0	\$0		
4	\$54,021	\$24,906	\$0	\$0	\$78,928	\$0	\$0	\$0		
5	\$55,750	\$25,703	\$0	\$0	\$81,453	\$0	\$0	\$0		
6	\$57,534	\$26,526	\$0	\$0	\$84,060	\$0	\$0	\$0		
7	\$59,375	\$27,375	\$0	\$0	\$86,750	\$0	\$0	\$0		
8	\$61,275	\$28,251	\$0	\$0	\$89,526	\$0	\$0	\$0		
9	\$63,236	\$29,155	\$0	\$0	\$92,391	\$0	\$0	\$0		
10	\$65,259	\$30,088	\$0	\$0	\$95,347	\$0	\$0	\$0		
11	\$67,348	\$31,050	\$0	\$0	\$98,398	\$0	\$0	\$0		
12	\$69,503	\$32,044	\$0	\$0	\$101,547	\$0	\$0	\$0		
13	\$71,727	\$33,070	\$0	\$0	\$104,796	\$0	\$0	\$0		
14	\$74,022	\$34,128	\$0	\$0	\$108,150	\$0	\$0	\$0		
15	\$76,391	\$35,220	\$0	\$0	\$111,611	\$0	\$0	\$0		
16	\$59,126	\$27,260	\$0	\$0	\$86,387	\$0	\$0	\$0		
17	\$40,679	\$18,755	\$0	\$0	\$59,434	\$0	\$0	\$0		
18	\$20,990	\$9,678	\$0	\$0	\$30,668	\$0	\$0	\$0		
Totals	\$973,145	\$448,686	\$0	\$0	\$1,421,831	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$12,288	\$5,665	\$0	\$0	\$17,953	\$0	\$0	\$0		
2	\$25,362	\$11,693	\$0	\$0	\$37,054	\$0	\$0	\$0		
3	\$38,260	\$18,101	\$0	\$0	\$57,360	\$0	\$0	\$0		
4	\$54,021	\$24,906	\$0	\$0	\$78,928	\$0	\$0	\$0		
5	\$55,750	\$25,703	\$0	\$0	\$81,453	\$0	\$0	\$0		
6	\$57,534	\$26,526	\$0	\$0	\$84,060	\$0	\$0	\$0		
7	\$59,375	\$27,375	\$0	\$0	\$86,750	\$0	\$0	\$0		
8	\$61,275	\$28,251	\$0	\$0	\$89,526	\$0	\$0	\$0		
9	\$63,236	\$29,155	\$0	\$0	\$92,391	\$0	\$0	\$0		
10	\$65,259	\$30,088	\$0	\$0	\$95,347	\$0	\$0	\$0		
11	\$67,348	\$31,050	\$0	\$0	\$98,398	\$0	\$0	\$0		
12	\$69,503	\$32,044	\$0	\$0	\$101,547	\$0	\$0	\$0		
13	\$71,727	\$33,070	\$0	\$0	\$104,796	\$0	\$0	\$0		
14	\$74,022	\$34,128	\$0	\$0	\$108,150	\$0	\$0	\$0		
15	\$76,391	\$35,220	\$0	\$0	\$111,611	\$0	\$0	\$0		
16	\$59,126	\$27,260	\$0	\$0	\$86,387	\$0	\$0	\$0		
17	\$40,679	\$18,755	\$0	\$0	\$59,434	\$0	\$0	\$0		
18	\$20,990	\$9,678	\$0	\$0	\$30,668	\$0	\$0	\$0		
Totals	\$973,145	\$448,686	\$0	\$0	\$1,421,831	\$0	\$0	\$0		

Participation and Total Participant Costs								
Year	Participation						Total Participant Costs	
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment
1	3000	0	3000	0	3000	3000	\$0	\$0
2	3000	0	6000	0	6000	6000	\$0	\$0
3	3000	0	9000	0	9000	9000	\$0	\$0
4	3000	0	12000	0	12000	12000	\$0	\$0
5	0	0	12000	0	12000	12000	\$0	\$0
6	0	0	12000	0	12000	12000	\$0	\$0
7	0	0	12000	0	12000	12000	\$0	\$0
8	0	0	12000	0	12000	12000	\$0	\$0
9	0	0	9000	0	9000	9000	\$0	\$0
10	0	0	6000	0	6000	6000	\$0	\$0
11	0	0	3000	0	3000	3000	\$0	\$0
Totals	12000	0	96000	0	96000	96000	\$0	\$0

Impacts and Savings																										
Year	Electric Impacts/Savings																Gas Impacts/Savings									
	Per Participant																Per Participant									
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO ₂	CO ₂ (est)	kWh	kWh (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)
1	0.04	0.04	0.03	0.03	0.03	0.03	99	99	112	112	83	83	99	297,254	297,254	112	112	83	83	99	297,254	297,254	0	0	0	0
2	0.04	0.04	0.03	0.03	0.03	0.03	99	99	223	223	166	166	197	594,508	594,508	112	112	83	83	99	297,254	297,254	0	0	0	0
3	0.04	0.04	0.03	0.03	0.03	0.03	99	99	335	335	249	249	296	891,761	891,761	112	112	83	83	99	297,254	297,254	0	0	0	0
4	0.04	0.04	0.03	0.03	0.03	0.03	99	99	447	447	332	332	394	1,189,015	1,189,015	112	112	83	83	99	297,254	297,254	0	0	0	0
5	0.04	0.04	0.03	0.03	0.03	0.03	99	99	447	447	332	332	394	1,189,015	1,189,015	0	0	0	0	0	0	0	0	0	0	
6	0.04	0.04	0.03	0.03	0.03	0.03	99	99	447	447	332	332	394	1,189,015	1,189,015	0	0	0	0	0	0	0	0	0	0	
7	0.04	0.04	0.03	0.03	0.03	0.03	99	99	447	447	332	332	394	1,189,015	1,189,015	0	0	0	0	0	0	0	0	0	0	
8	0.04	0.04	0.03	0.03	0.03	0.03	99	99	447	447	332	332	394	1,189,015	1,189,015	0	0	0	0	0	0	0	0	0	0	
9	0.04	0.04	0.03	0.03	0.03	0.03	99	99	335	335	249	249	296	891,761	891,761	0	0	0	0	0	0	0	0	0	0	
10	0.04	0.04	0.03	0.03	0.03	0.03	99	99	223	223	166	166	197	594,508	594,508	0	0	0	0	0	0	0	0	0	0	
11	0.04	0.04	0.03	0.03	0.03	0.03	99	99	112	112	83	83	99	297,254	297,254	0	0	0	0	0	0	0	0	0	0	
Totals									1,090	1,090				9,512,122	9,512,122							1,189,015	1,189,015	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$7	\$0	\$7	\$20,992	\$0	\$20,992	\$20,992	\$0	\$20,992
2	\$7	\$0	\$7	\$42,823	\$0	\$42,823	\$42,823	\$0	\$42,823
3	\$7	\$0	\$7	\$65,519	\$0	\$65,519	\$65,519	\$0	\$65,519
4	\$7	\$0	\$7	\$89,106	\$0	\$89,106	\$89,106	\$0	\$89,106
5	\$8	\$0	\$8	\$90,868	\$0	\$90,868	\$90,868	\$0	\$90,868
6	\$8	\$0	\$8	\$92,706	\$0	\$92,706	\$92,706	\$0	\$92,706
7	\$8	\$0	\$8	\$94,560	\$0	\$94,560	\$94,560	\$0	\$94,560
8	\$8	\$0	\$8	\$96,451	\$0	\$96,451	\$96,451	\$0	\$96,451
9	\$8	\$0	\$8	\$73,785	\$0	\$73,785	\$73,785	\$0	\$73,785
10	\$8	\$0	\$8	\$50,174	\$0	\$50,174	\$50,174	\$0	\$50,174
11	\$9	\$0	\$9	\$25,989	\$0	\$25,989	\$25,989	\$0	\$25,989
Totals	\$85	\$0	\$85	\$742,892	\$0	\$742,892	\$742,892	\$0	\$742,892

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Hardware	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Saved	\$/CCF-Saved
1	\$42,199	\$0	\$0	\$0	\$42,199	\$232	\$232	\$0	\$0	\$0
2	\$21,479	\$0	\$0	\$0	\$21,479	\$59	\$59	\$0	\$0	\$0
3	\$21,866	\$0	\$0	\$0	\$21,866	\$40	\$40	\$0	\$0	\$0
4	\$38,954	\$0	\$0	\$0	\$38,954	\$54	\$54	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$124,499	\$0	\$0	\$0	\$124,499	\$385	\$385	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$15,894	\$8,300	\$0	\$0	\$24,194	\$0	\$0	\$0	\$0	\$0
2	\$32,805	\$17,131	\$0	\$0	\$49,937	\$0	\$0	\$0	\$0	\$0
3	\$50,783	\$26,519	\$0	\$0	\$77,302	\$0	\$0	\$0	\$0	\$0
4	\$69,877	\$36,491	\$0	\$0	\$106,368	\$0	\$0	\$0	\$0	\$0
5	\$72,113	\$37,658	\$0	\$0	\$109,771	\$0	\$0	\$0	\$0	\$0
6	\$74,421	\$38,863	\$0	\$0	\$113,284	\$0	\$0	\$0	\$0	\$0
7	\$76,802	\$40,107	\$0	\$0	\$116,909	\$0	\$0	\$0	\$0	\$0
8	\$79,260	\$41,390	\$0	\$0	\$120,650	\$0	\$0	\$0	\$0	\$0
9	\$81,347	\$32,036	\$0	\$0	\$83,383	\$0	\$0	\$0	\$0	\$0
10	\$42,207	\$22,041	\$0	\$0	\$64,248	\$0	\$0	\$0	\$0	\$0
11	\$21,779	\$11,373	\$0	\$0	\$33,152	\$0	\$0	\$0	\$0	\$0
Totals	\$597,288	\$311,910	\$0	\$0	\$909,198	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$15,894	\$8,300	\$0	\$0	\$24,194	\$0	\$0	\$0	\$0	\$0
2	\$32,805	\$17,131	\$0	\$0	\$49,937	\$0	\$0	\$0	\$0	\$0
3	\$50,783	\$26,519	\$0	\$0	\$77,302	\$0	\$0	\$0	\$0	\$0
4	\$69,877	\$36,491	\$0	\$0	\$106,368	\$0	\$0	\$0	\$0	\$0
5	\$72,113	\$37,658	\$0	\$0	\$109,771	\$0	\$0	\$0	\$0	\$0
6	\$74,421	\$38,863	\$0	\$0	\$113,284	\$0	\$0	\$0	\$0	\$0
7	\$76,802	\$40,107	\$0	\$0	\$116,909	\$0	\$0	\$0	\$0	\$0
8	\$79,260	\$41,390	\$0	\$0	\$120,650	\$0	\$0	\$0	\$0	\$0
9	\$81,347	\$32,036	\$0	\$0	\$83,383	\$0	\$0	\$0	\$0	\$0
10	\$42,207	\$22,041	\$0	\$0	\$64,248	\$0	\$0	\$0	\$0	\$0
11	\$21,779	\$11,373	\$0	\$0	\$33,152	\$0	\$0	\$0	\$0	\$0
Totals	\$597,288	\$311,910	\$0	\$0	\$909,198	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ no-participants)	One-Time Investment	Annual Investment	Total Costs
1	3000	0	3000	0	3000	3000	\$0	\$0	\$0
2	3000	0	6000	0	6000	6000	\$0	\$0	\$0
3	3000	0	9000	0	9000	9000	\$0	\$0	\$0
4	3000	0	12000	0	12000	12000	\$0	\$0	\$0
5	0	0	12000	0	12000	12000	\$0	\$0	\$0
6	0	0	12000	0	12000	12000	\$0	\$0	\$0
7	0	0	12000	0	12000	12000	\$0	\$0	\$0
8	0	0	9000	0	9000	9000	\$0	\$0	\$0
9	0	0	6000	0	6000	6000	\$0	\$0	\$0
10	0	0	3000	0	3000	3000	\$0	\$0	\$0
Totals	12000	0	84000	0	84000	84000	\$0	\$0	\$0

Impacts and Savings																													
Year	Electric Impacts/Savings														Gas Impacts/Savings														
	Per Participant														Per Participant														
	Cumulative														Yearly Incremental (Per Participant * Incremental Participants)														
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	MMBtu	MMBtu (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	MMBtu	MMBtu (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	MMBtu	MMBtu (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	
1	0.03	0.03	0.01	0.01	0.02	0.02	191	191	95	44	44	62	62	573,470	573,470	0	0	0	0	0	0	0	0	0	0	0	0		
2	0.03	0.03	0.01	0.01	0.02	0.02	191	191	191	89	89	123	123	1,146,940	1,146,940	95	95	44	44	62	62	573,470	573,470	0	0	0	0		
3	0.03	0.03	0.01	0.01	0.02	0.02	191	191	286	286	133	133	185	1,720,409	1,720,409	95	95	44	44	62	62	573,470	573,470	0	0	0	0		
4	0.03	0.03	0.01	0.01	0.02	0.02	191	191	382	382	177	177	247	2,293,879	2,293,879	95	95	44	44	62	62	573,470	573,470	0	0	0	0		
5	0.03	0.03	0.01	0.01	0.02	0.02	191	191	382	382	177	177	247	2,293,879	2,293,879	0	0	0	0	0	0	0	0	0	0	0	0		
6	0.03	0.03	0.01	0.01	0.02	0.02	191	191	382	382	177	177	247	2,293,879	2,293,879	0	0	0	0	0	0	0	0	0	0	0	0		
7	0.03	0.03	0.01	0.01	0.02	0.02	191	191	382	382	177	177	247	2,293,879	2,293,879	0	0	0	0	0	0	0	0	0	0	0	0		
8	0.03	0.03	0.01	0.01	0.02	0.02	191	191	286	286	133	133	185	1,720,409	1,720,409	0	0	0	0	0	0	0	0	0	0	0	0		
9	0.03	0.03	0.01	0.01	0.02	0.02	191	191	191	89	89	123	123	1,146,940	1,146,940	0	0	0	0	0	0	0	0	0	0	0	0		
10	0.03	0.03	0.01	0.01	0.02	0.02	191	191	95	95	44	44	62	62	573,470	573,470	0	0	0	0	0	0	0	0	0	0	0		
Totals							1,812	1,812						16,057,155	16,057,155									2,293,879	2,293,879	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Total	Net Fuel Electric	Net Fuel Gas	Total
1	\$13	\$0	\$13	\$40,498	\$0	\$40,498	\$40,498	\$0	\$40,498
2	\$14	\$0	\$14	\$82,615	\$0	\$82,615	\$82,615	\$0	\$82,615
3	\$14	\$0	\$14	\$126,401	\$0	\$126,401	\$126,401	\$0	\$126,401
4	\$14	\$0	\$14	\$171,906	\$0	\$171,906	\$171,906	\$0	\$171,906
5	\$15	\$0	\$15	\$175,344	\$0	\$175,344	\$175,344	\$0	\$175,344
6	\$15	\$0	\$15	\$178,851	\$0	\$178,851	\$178,851	\$0	\$178,851
7	\$15	\$0	\$15	\$182,428	\$0	\$182,428	\$182,428	\$0	\$182,428
8	\$16	\$0	\$16	\$139,557	\$0	\$139,557	\$139,557	\$0	\$139,557
9	\$16	\$0	\$16	\$94,899	\$0	\$94,899	\$94,899	\$0	\$94,899
10	\$16	\$0	\$16	\$48,398	\$0	\$48,398	\$48,398	\$0	\$48,398
Totals	\$148	\$0	\$148	\$1,240,895	\$0	\$1,240,895	\$1,240,895	\$0	\$1,240,895

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Marketing	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF
1	\$0	\$25,319	\$0	\$0	\$25,319	\$239	\$239	\$0	\$0	\$0
2	\$0	\$25,775	\$0	\$0	\$25,775	\$122	\$122	\$0	\$0	\$0
3	\$0	\$26,239	\$0	\$0	\$26,239	\$83	\$83	\$0	\$0	\$0
4	\$0	\$26,711	\$0	\$0	\$26,711	\$63	\$63	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$104,045	\$0	\$0	\$104,045	\$506	\$506	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Gas/CCF	T&I	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$23,895	\$4,422	\$0	\$0	\$28,227	\$0	\$0	\$0	\$0	\$0
2	\$49,134	\$9,126	\$0	\$0	\$58,260	\$0	\$0	\$0	\$0	\$0
3	\$76,059	\$14,127	\$0	\$0	\$90,186	\$0	\$0	\$0	\$0	\$0
4	\$104,657	\$19,439	\$0	\$0	\$124,096	\$0	\$0	\$0	\$0	\$0
5	\$108,006	\$20,061	\$0	\$0	\$128,067	\$0	\$0	\$0	\$0	\$0
6	\$111,462	\$20,703	\$0	\$0	\$132,165	\$0	\$0	\$0	\$0	\$0
7	\$115,029	\$21,366	\$0	\$0	\$136,395	\$0	\$0	\$0	\$0	\$0
8	\$89,032	\$16,537	\$0	\$0	\$105,570	\$0	\$0	\$0	\$0	\$0
9	\$61,254	\$11,378	\$0	\$0	\$72,632	\$0	\$0	\$0	\$0	\$0
10	\$31,607	\$5,871	\$0	\$0	\$37,478	\$0	\$0	\$0	\$0	\$0
Totals	\$770,045	\$143,030	\$0	\$0	\$913,076	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Gas/CCF	T&I	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$23,895	\$4,422	\$0	\$0	\$28,227	\$0	\$0	\$0	\$0	\$0
2	\$49,134	\$9,126	\$0	\$0	\$58,260	\$0	\$0	\$0	\$0	\$0
3	\$76,059	\$14,127	\$0	\$0	\$90,186	\$0	\$0	\$0	\$0	\$0
4	\$104,657	\$19,439	\$0	\$0	\$124,096	\$0	\$0	\$0	\$0	\$0
5	\$108,006	\$20,061	\$0	\$0	\$128,067	\$0	\$0	\$0	\$0	\$0
6	\$111,462	\$20,703	\$0	\$0	\$132,165	\$0	\$0	\$0	\$0	\$0
7	\$115,029	\$21,366	\$0	\$0	\$136,395	\$0	\$0	\$0	\$0	\$0
8	\$89,032	\$16,537	\$0	\$0	\$105,570	\$0	\$0	\$0	\$0	\$0
9	\$61,254	\$11,378	\$0	\$0	\$72,632	\$0	\$0	\$0	\$0	\$0
10	\$31,607	\$5,871	\$0	\$0	\$37,478	\$0	\$0	\$0	\$0	\$0
Totals	\$770,045	\$143,030	\$0	\$0	\$913,076	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/Free Riders)	Cumulative Participants (w/No-Participants)	One-Time Investment	Annual Investment	Total Costs
1	25	0	25	0	25	25	\$0	\$0	\$0
2	25	0	50	0	50	50	\$0	\$0	\$0
3	25	0	75	0	75	75	\$0	\$0	\$0
4	25	0	100	0	100	100	\$0	\$0	\$0
5	0	0	100	0	100	100	\$0	\$0	\$0
6	0	0	100	0	100	100	\$0	\$0	\$0
7	0	0	100	0	100	100	\$0	\$0	\$0
8	0	0	100	0	100	100	\$0	\$0	\$0
9	0	0	100	0	100	100	\$0	\$0	\$0
10	0	0	100	0	100	100	\$0	\$0	\$0
11	0	0	100	0	100	100	\$0	\$0	\$0
12	0	0	100	0	100	100	\$0	\$0	\$0
13	0	0	100	0	100	100	\$0	\$0	\$0
14	0	0	100	0	100	100	\$0	\$0	\$0
15	0	0	100	0	100	100	\$0	\$0	\$0
16	0	0	75	0	75	75	\$0	\$0	\$0
17	0	0	50	0	50	50	\$0	\$0	\$0
18	0	0	25	0	25	25	\$0	\$0	\$0
Totals	100	0	1500	0	1500	1500	\$0	\$0	\$0

Impacts and Savings																																
Year	Electric Impacts/Savings										Gas Impacts/Savings																					
	Per Participant										Per Participant																					
Year	Cumulative										Yearly Incremental (Per Participant * Incremental Participants)						Cumulative															
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh	kWh (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh	kWh (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh	kWh (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)		
1	2	2	2	2	0	0	0	42	42	42	42	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	0	0	0	
2	2	2	2	2	0	0	0	84	84	84	84	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	0	0	0	
3	2	2	2	2	0	0	0	126	126	126	126	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	0	0	0	
4	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	0	0	0	
5	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	2	2	2	2	0	0	0	168	168	168	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	2	2	2	2	0	0	0	126	126	126	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	2	2	2	2	0	0	0	84	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	2	2	2	2	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals																																

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF Saved	\$/CCF Saved
1	\$26,948	\$376,240	\$114,854	\$9,273	\$526,315	\$12,515	\$12,515	\$0	\$0	\$0
2	\$32,210	\$496,251	\$191,300	\$10,903	\$730,715	\$8,687	\$8,687	\$0	\$0	\$0
3	\$36,490	\$614,613	\$273,564	\$12,195	\$936,862	\$7,426	\$7,426	\$0	\$0	\$0
4	\$40,327	\$726,368	\$360,709	\$13,282	\$1,149,686	\$6,834	\$6,834	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$135,974	\$2,221,471	\$840,457	\$45,673	\$3,343,575	\$35,462	\$30,462	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$0	\$4,202	\$0	\$0	\$4,202	\$0	\$0	\$0	\$0	\$0
2	\$0	\$8,673	\$0	\$0	\$8,673	\$0	\$0	\$0	\$0	\$0
3	\$0	\$13,426	\$0	\$0	\$13,426	\$0	\$0	\$0	\$0	\$0
4	\$0	\$18,475	\$0	\$0	\$18,475	\$0	\$0	\$0	\$0	\$0
5	\$0	\$19,066	\$0	\$0	\$19,066	\$0	\$0	\$0	\$0	\$0
6	\$0	\$19,676	\$0	\$0	\$19,676	\$0	\$0	\$0	\$0	\$0
7	\$0	\$20,305	\$0	\$0	\$20,305	\$0	\$0	\$0	\$0	\$0
8	\$0	\$20,955	\$0	\$0	\$20,955	\$0	\$0	\$0	\$0	\$0
9	\$0	\$21,626	\$0	\$0	\$21,626	\$0	\$0	\$0	\$0	\$0
10	\$0	\$22,318	\$0	\$0	\$22,318	\$0	\$0	\$0	\$0	\$0
11	\$0	\$23,032	\$0	\$0	\$23,032	\$0	\$0	\$0	\$0	\$0
12	\$0	\$23,769	\$0	\$0	\$23,769	\$0	\$0	\$0	\$0	\$0
13	\$0	\$24,530	\$0	\$0	\$24,530	\$0	\$0	\$0	\$0	\$0
14	\$0	\$25,315	\$0	\$0	\$25,315	\$0	\$0	\$0	\$0	\$0
15	\$0	\$26,125	\$0	\$0	\$26,125	\$0	\$0	\$0	\$0	\$0
16	\$0	\$26,961	\$0	\$0	\$26,961	\$0	\$0	\$0	\$0	\$0
17	\$0	\$27,823	\$0	\$0	\$27,823	\$0	\$0	\$0	\$0	\$0
18	\$0	\$28,712	\$0	\$0	\$28,712	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$332,803	\$0	\$0	\$332,803	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$0	\$4,202	\$0	\$0	\$4,202	\$0	\$0	\$0	\$0	\$0
2	\$0	\$8,673	\$0	\$0	\$8,673	\$0	\$0	\$0	\$0	\$0
3	\$0	\$13,426	\$0	\$0	\$13,426	\$0	\$0	\$0	\$0	\$0
4	\$0	\$18,475	\$0	\$0	\$18,475	\$0	\$0	\$0	\$0	\$0
5	\$0	\$19,066	\$0	\$0	\$19,066	\$0	\$0	\$0	\$0	\$0
6	\$0	\$19,676	\$0	\$0	\$19,676	\$0	\$0	\$0	\$0	\$0
7	\$0	\$20,305	\$0	\$0	\$20,305	\$0	\$0	\$0	\$0	\$0
8	\$0	\$20,955	\$0	\$0	\$20,955	\$0	\$0	\$0	\$0	\$0
9	\$0	\$21,626	\$0	\$0	\$21,626	\$0	\$0	\$0	\$0	\$0
10	\$0	\$22,318	\$0	\$0	\$22,318	\$0	\$0	\$0	\$0	\$0
11	\$0	\$23,032	\$0	\$0	\$23,032	\$0	\$0	\$0	\$0	\$0
12	\$0	\$23,769	\$0	\$0	\$23,769	\$0	\$0	\$0	\$0	\$0
13	\$0	\$24,530	\$0	\$0	\$24,530	\$0	\$0	\$0	\$0	\$0
14	\$0	\$25,315	\$0	\$0	\$25,315	\$0	\$0	\$0	\$0	\$0
15	\$0	\$26,125	\$0	\$0	\$26,125	\$0	\$0	\$0	\$0	\$0
16	\$0	\$26,961	\$0	\$0	\$26,961	\$0	\$0	\$0	\$0	\$0
17	\$0	\$27,823	\$0	\$0	\$27,823	\$0	\$0	\$0	\$0	\$0
18	\$0	\$28,712	\$0	\$0	\$28,712	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$332,803	\$0	\$0	\$332,803	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net Non-participants)	One-Time Investment	Annual Investment	Total Costs
1	25	0	25	0	25	25	\$0	\$0	\$0
2	25	0	50	0	50	50	\$0	\$0	\$0
3	25	0	75	0	75	75	\$0	\$0	\$0
4	25	0	100	0	100	100	\$0	\$0	\$0
5	0	0	100	0	100	100	\$0	\$0	\$0
6	0	0	100	0	100	100	\$0	\$0	\$0
7	0	0	75	0	75	75	\$0	\$0	\$0
8	0	0	50	0	50	50	\$0	\$0	\$0
9	0	0	25	0	25	25	\$0	\$0	\$0
Total	100	0	600	0	600	600	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings										Gas Impacts/Savings																			
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)					Per Participant					Cumulative					Yearly Incremental				
	kWh	kWh (net)	Summer Cdn kWh	Summer Cdn (net)	Winter Cdn kWh	Winter Cdn (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Cdn kWh	Summer Cdn (net)	Winter Cdn kWh	Winter Cdn (net)	kWh	kWh (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)								
1	106	106	106	106	0	0	0	0	0	2,645	2,645	2,645	2,645	0	0	2,645	2,645	2,645	2,645	0	0	0	0							
2	106	106	106	106	0	0	0	0	0	5,290	5,290	5,290	5,290	0	0	2,645	2,645	2,645	2,645	0	0	0	0							
3	106	106	106	106	0	0	0	0	0	7,935	7,935	7,935	7,935	0	0	2,645	2,645	2,645	2,645	0	0	0	0							
4	106	106	106	106	0	0	0	0	0	10,580	10,580	10,580	10,580	0	0	2,645	2,645	2,645	2,645	0	0	0	0							
5	106	106	106	106	0	0	0	0	0	10,580	10,580	10,580	10,580	0	0	0	0	0	0	0	0	0	0							
6	106	106	106	106	0	0	0	0	0	10,580	10,580	10,580	10,580	0	0	0	0	0	0	0	0	0	0							
7	106	106	106	106	0	0	0	0	0	7,935	7,935	7,935	7,935	0	0	0	0	0	0	0	0	0	0							
8	106	106	106	106	0	0	0	0	0	5,290	5,290	5,290	5,290	0	0	0	0	0	0	0	0	0	0							
9	106	106	106	106	0	0	0	0	0	2,645	2,645	2,645	2,645	0	0	0	0	0	0	0	0	0	0							
Total																														

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric				Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	
1	\$0	\$264,288	\$0	\$0	\$264,288	\$0	\$0	\$0	\$0
2	\$0	\$545,491	\$0	\$0	\$545,491	\$0	\$0	\$0	\$0
3	\$0	\$844,420	\$0	\$0	\$844,420	\$0	\$0	\$0	\$0
4	\$0	\$1,161,823	\$0	\$0	\$1,161,823	\$0	\$0	\$0	\$0
5	\$0	\$1,199,104	\$0	\$0	\$1,199,104	\$0	\$0	\$0	\$0
6	\$0	\$1,237,475	\$0	\$0	\$1,237,475	\$0	\$0	\$0	\$0
7	\$0	\$957,806	\$0	\$0	\$957,806	\$0	\$0	\$0	\$0
8	\$0	\$658,971	\$0	\$0	\$658,971	\$0	\$0	\$0	\$0
9	\$0	\$340,029	\$0	\$0	\$340,029	\$0	\$0	\$0	\$0
Total	\$0	\$7,209,507	\$0	\$0	\$7,209,507	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric				Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	
1	\$0	\$264,288	\$0	\$0	\$264,288	\$0	\$0	\$0	\$0
2	\$0	\$545,491	\$0	\$0	\$545,491	\$0	\$0	\$0	\$0
3	\$0	\$844,420	\$0	\$0	\$844,420	\$0	\$0	\$0	\$0
4	\$0	\$1,161,823	\$0	\$0	\$1,161,823	\$0	\$0	\$0	\$0
5	\$0	\$1,199,104	\$0	\$0	\$1,199,104	\$0	\$0	\$0	\$0
6	\$0	\$1,237,475	\$0	\$0	\$1,237,475	\$0	\$0	\$0	\$0
7	\$0	\$957,806	\$0	\$0	\$957,806	\$0	\$0	\$0	\$0
8	\$0	\$658,971	\$0	\$0	\$658,971	\$0	\$0	\$0	\$0
9	\$0	\$340,029	\$0	\$0	\$340,029	\$0	\$0	\$0	\$0
Total	\$0	\$7,209,507	\$0	\$0	\$7,209,507	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ no-participants)	One-Time Investment	Annual Investment	Total Costs
1	25	0	25	0	25	25	\$0	\$0	\$0
2	25	0	50	0	50	50	\$0	\$0	\$0
3	25	0	75	0	75	75	\$0	\$0	\$0
4	25	0	100	0	100	100	\$0	\$0	\$0
5	0	0	100	0	100	100	\$0	\$0	\$0
6	0	0	100	0	100	100	\$0	\$0	\$0
7	0	0	100	0	100	100	\$0	\$0	\$0
8	0	0	100	0	100	100	\$0	\$0	\$0
9	0	0	100	0	100	100	\$0	\$0	\$0
10	0	0	100	0	100	100	\$0	\$0	\$0
11	0	0	100	0	100	100	\$0	\$0	\$0
12	0	0	100	0	100	100	\$0	\$0	\$0
13	0	0	100	0	100	100	\$0	\$0	\$0
14	0	0	100	0	100	100	\$0	\$0	\$0
15	0	0	100	0	100	100	\$0	\$0	\$0
16	0	0	75	0	75	75	\$0	\$0	\$0
17	0	0	50	0	50	50	\$0	\$0	\$0
18	0	0	25	0	25	25	\$0	\$0	\$0
Totals	100	0	1500	0	1500	1500	\$0	\$0	\$0

Impacts and Savings																							
Year	Electric Impacts/Savings										Gas Impacts/Savings												
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)						Per Participant						
	kWh (net)	kWh (net)	Summer Con (kWh)	Summer Con (net)	Winter Con (kWh)	Winter Con (net)	kWh (net)	kWh (net)	kWh (net)	kWh (net)	Summer Con (kWh)	Summer Con (net)	Winter Con (kWh)	Winter Con (net)	kWh (net)	kWh (net)	CO ₂ (net)						
1	2	2	2	2	0	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	
2	2	2	2	2	0	0	0	0	0	84	84	84	84	0	0	0	0	0	0	0	0	0	
3	2	2	2	2	0	0	0	0	0	127	127	127	127	0	0	0	0	0	0	0	0	0	
4	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
5	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
6	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
7	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
8	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
9	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
10	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
11	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
12	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
13	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
14	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
15	2	2	2	2	0	0	0	0	0	169	169	169	169	0	0	0	0	0	0	0	0	0	
16	2	2	2	2	0	0	0	0	0	127	127	127	127	0	0	0	0	0	0	0	0	0	
17	2	2	2	2	0	0	0	0	0	84	84	84	84	0	0	0	0	0	0	0	0	0	
18	2	2	2	2	0	0	0	0	0	42	42	42	42	0	0	0	0	0	0	0	0	0	
Totals										0	0												

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Saved	\$/CCF-Saved
1	\$27,735	\$386,197	\$118,208	\$9,544	\$541,683	\$12,832	\$12,832	\$0	\$0	\$0
2	\$33,453	\$215,563	\$198,776	\$11,348	\$759,150	\$8,992	\$8,992	\$0	\$0	\$0
3	\$38,158	\$642,713	\$286,072	\$12,752	\$979,695	\$7,736	\$7,736	\$0	\$0	\$0
4	\$42,185	\$769,245	\$377,326	\$13,894	\$1,202,649	\$7,122	\$7,122	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$141,541	\$2,313,717	\$880,381	\$47,538	\$3,483,177	\$38,681	\$38,681	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$0	\$4,218	\$0	\$0	\$4,218	\$0	\$0	\$0	\$0	\$0
2	\$0	\$8,706	\$0	\$0	\$8,706	\$0	\$0	\$0	\$0	\$0
3	\$0	\$13,477	\$0	\$0	\$13,477	\$0	\$0	\$0	\$0	\$0
4	\$0	\$18,544	\$0	\$0	\$18,544	\$0	\$0	\$0	\$0	\$0
5	\$0	\$19,138	\$0	\$0	\$19,138	\$0	\$0	\$0	\$0	\$0
6	\$0	\$19,750	\$0	\$0	\$19,750	\$0	\$0	\$0	\$0	\$0
7	\$0	\$20,382	\$0	\$0	\$20,382	\$0	\$0	\$0	\$0	\$0
8	\$0	\$21,034	\$0	\$0	\$21,034	\$0	\$0	\$0	\$0	\$0
9	\$0	\$21,708	\$0	\$0	\$21,708	\$0	\$0	\$0	\$0	\$0
10	\$0	\$22,402	\$0	\$0	\$22,402	\$0	\$0	\$0	\$0	\$0
11	\$0	\$23,119	\$0	\$0	\$23,119	\$0	\$0	\$0	\$0	\$0
12	\$0	\$23,859	\$0	\$0	\$23,859	\$0	\$0	\$0	\$0	\$0
13	\$0	\$24,622	\$0	\$0	\$24,622	\$0	\$0	\$0	\$0	\$0
14	\$0	\$25,410	\$0	\$0	\$25,410	\$0	\$0	\$0	\$0	\$0
15	\$0	\$26,223	\$0	\$0	\$26,223	\$0	\$0	\$0	\$0	\$0
16	\$0	\$26,223	\$0	\$0	\$26,223	\$0	\$0	\$0	\$0	\$0
17	\$0	\$13,964	\$0	\$0	\$13,964	\$0	\$0	\$0	\$0	\$0
18	\$0	\$7,206	\$0	\$0	\$7,206	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$334,081	\$0	\$0	\$334,081	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$0	\$4,218	\$0	\$0	\$4,218	\$0	\$0	\$0	\$0	\$0
2	\$0	\$8,706	\$0	\$0	\$8,706	\$0	\$0	\$0	\$0	\$0
3	\$0	\$13,477	\$0	\$0	\$13,477	\$0	\$0	\$0	\$0	\$0
4	\$0	\$18,544	\$0	\$0	\$18,544	\$0	\$0	\$0	\$0	\$0
5	\$0	\$19,138	\$0	\$0	\$19,138	\$0	\$0	\$0	\$0	\$0
6	\$0	\$19,750	\$0	\$0	\$19,750	\$0	\$0	\$0	\$0	\$0
7	\$0	\$20,382	\$0	\$0	\$20,382	\$0	\$0	\$0	\$0	\$0
8	\$0	\$21,034	\$0	\$0	\$21,034	\$0	\$0	\$0	\$0	\$0
9	\$0	\$21,708	\$0	\$0	\$21,708	\$0	\$0	\$0	\$0	\$0
10	\$0	\$22,402	\$0	\$0	\$22,402	\$0	\$0	\$0	\$0	\$0
11	\$0	\$23,119	\$0	\$0	\$23,119	\$0	\$0	\$0	\$0	\$0
12	\$0	\$23,859	\$0	\$0	\$23,859	\$0	\$0	\$0	\$0	\$0
13	\$0	\$24,622	\$0	\$0	\$24,622	\$0	\$0	\$0	\$0	\$0
14	\$0	\$25,410	\$0	\$0	\$25,410	\$0	\$0	\$0	\$0	\$0
15	\$0	\$26,223	\$0	\$0	\$26,223	\$0	\$0	\$0	\$0	\$0
16	\$0	\$26,223	\$0	\$0	\$26,223	\$0	\$0	\$0	\$0	\$0
17	\$0	\$13,964	\$0	\$0	\$13,964	\$0	\$0	\$0	\$0	\$0
18	\$0	\$7,206	\$0	\$0	\$7,206	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$334,081	\$0	\$0	\$334,081	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net Non-Participants)	One-Time Investment	Annual Investment	Total Costs
1	25	0	25	0	25	25	\$0	\$0	\$0
2	25	0	50	0	50	50	\$0	\$0	\$0
3	25	0	75	0	75	75	\$0	\$0	\$0
4	25	0	100	0	100	100	\$0	\$0	\$0
5	0	0	100	0	100	100	\$0	\$0	\$0
6	0	0	100	0	100	100	\$0	\$0	\$0
7	0	0	75	0	75	75	\$0	\$0	\$0
8	0	0	50	0	50	50	\$0	\$0	\$0
9	0	0	25	0	25	25	\$0	\$0	\$0
Total	100	0	800	0	800	800	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings															Gas Impacts/Savings														
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)					Per Participant					Cumulative					Yearly Incremental				
	kWh	kWh (net)	Summer Cost (\$/kWh)	Summer Cost (net)	Winter Cost (\$/kWh)	Winter Cost (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Cost (\$/kWh)	Summer Cost (net)	Winter Cost (\$/kWh)	Winter Cost (net)	kWh	kWh (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)						
1	106	106	106	106	0	0	0	0	0	2,655	2,655	2,655	0	0	0	0	0	0	0	0	0	0	0	0						
2	106	106	106	106	0	0	0	0	0	5,310	5,310	5,310	0	0	0	0	0	0	0	0	0	0	0	0						
3	106	106	106	106	0	0	0	0	0	7,965	7,965	7,965	0	0	0	0	0	0	0	0	0	0	0	0						
4	106	106	106	106	0	0	0	0	0	10,620	10,620	10,620	0	0	0	0	0	0	0	0	0	0	0	0						
5	106	106	106	106	0	0	0	0	0	10,620	10,620	10,620	0	0	0	0	0	0	0	0	0	0	0	0						
6	106	106	106	106	0	0	0	0	0	10,620	10,620	10,620	0	0	0	0	0	0	0	0	0	0	0	0						
7	106	106	106	106	0	0	0	0	0	7,965	7,965	7,965	0	0	0	0	0	0	0	0	0	0	0	0						
8	106	106	106	106	0	0	0	0	0	5,310	5,310	5,310	0	0	0	0	0	0	0	0	0	0	0	0						
9	106	106	106	106	0	0	0	0	0	2,655	2,655	2,655	0	0	0	0	0	0	0	0	0	0	0	0						
Total																														

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Rider/Electric	Net Free/Rider/Gas	Net Free/Rider/Total	Net Fuel/Electric	Net Fuel/Gas	Net Fuel/Total
1	\$10,970	\$0	\$10,970	\$274,256	\$0	\$274,256	\$274,256	\$0	\$274,256
2	\$11,190	\$0	\$11,190	\$559,482	\$0	\$559,482	\$559,482	\$0	\$559,482
3	\$11,413	\$0	\$11,413	\$856,008	\$0	\$856,008	\$856,008	\$0	\$856,008
4	\$11,642	\$0	\$11,642	\$1,164,171	\$0	\$1,164,171	\$1,164,171	\$0	\$1,164,171
5	\$11,876	\$0	\$11,876	\$1,187,455	\$0	\$1,187,455	\$1,187,455	\$0	\$1,187,455
6	\$12,112	\$0	\$12,112	\$1,211,204	\$0	\$1,211,204	\$1,211,204	\$0	\$1,211,204
7	\$12,354	\$0	\$12,354	\$926,571	\$0	\$926,571	\$926,571	\$0	\$926,571
8	\$12,601	\$0	\$12,601	\$630,068	\$0	\$630,068	\$630,068	\$0	\$630,068
9	\$12,853	\$0	\$12,853	\$321,335	\$0	\$321,335	\$321,335	\$0	\$321,335
Total	\$107,011	\$0	\$107,011	\$7,130,549	\$0	\$7,130,549	\$7,130,549	\$0	\$7,130,549

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Onsite	Other	Total	\$/kW	\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Electric	Address Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$191,163	\$0	\$0	\$191,163	\$0	\$0	\$0		
2	\$0	\$394,560	\$0	\$0	\$394,560	\$0	\$0	\$0		
3	\$0	\$610,778	\$0	\$0	\$610,778	\$0	\$0	\$0		
4	\$0	\$840,431	\$0	\$0	\$840,431	\$0	\$0	\$0		
5	\$0	\$867,324	\$0	\$0	\$867,324	\$0	\$0	\$0		
6	\$0	\$895,079	\$0	\$0	\$895,079	\$0	\$0	\$0		
7	\$0	\$692,791	\$0	\$0	\$692,791	\$0	\$0	\$0		
8	\$0	\$476,640	\$0	\$0	\$476,640	\$0	\$0	\$0		
9	\$0	\$245,946	\$0	\$0	\$245,946	\$0	\$0	\$0		
Total	\$0	\$5,214,712	\$0	\$0	\$5,214,712	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric				Cumulative Gas					
	Electric	Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$191,163	\$0	\$0	\$191,163	\$0	\$0	\$0		
2	\$0	\$394,560	\$0	\$0	\$394,560	\$0	\$0	\$0		
3	\$0	\$610,778	\$0	\$0	\$610,778	\$0	\$0	\$0		
4	\$0	\$840,431	\$0	\$0	\$840,431	\$0	\$0	\$0		
5	\$0	\$867,324	\$0	\$0	\$867,324	\$0	\$0	\$0		
6	\$0	\$895,079	\$0	\$0	\$895,079	\$0	\$0	\$0		
7	\$0	\$692,791	\$0	\$0	\$692,791	\$0	\$0	\$0		
8	\$0	\$476,640	\$0	\$0	\$476,640	\$0	\$0	\$0		
9	\$0	\$245,946	\$0	\$0	\$245,946	\$0	\$0	\$0		
Total	\$0	\$5,214,712	\$0	\$0	\$5,214,712	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (Net/Free Riders)	Participants (Net/Free Riders)	One-Time Investment	Annual	Total Costs
1	3150	0	3150	0	3150	3150	\$0	\$0	\$0
2	2625	0	5775	0	5775	5775	\$0	\$0	\$0
3	2625	0	8400	0	8400	8400	\$0	\$0	\$0
4	2625	0	11025	0	11025	11025	\$0	\$0	\$0
5	0	0	11025	0	11025	11025	\$0	\$0	\$0
6	0	0	11025	0	11025	11025	\$0	\$0	\$0
7	0	0	11025	0	11025	11025	\$0	\$0	\$0
8	0	0	11025	0	11025	11025	\$0	\$0	\$0
9	0	0	11025	0	11025	11025	\$0	\$0	\$0
10	0	0	11025	0	11025	11025	\$0	\$0	\$0
11	0	0	11025	0	11025	11025	\$0	\$0	\$0
12	0	0	11025	0	11025	11025	\$0	\$0	\$0
13	0	0	11025	0	11025	11025	\$0	\$0	\$0
14	0	0	11025	0	11025	11025	\$0	\$0	\$0
15	0	0	11025	0	11025	11025	\$0	\$0	\$0
16	0	0	11025	0	11025	11025	\$0	\$0	\$0
17	0	0	11025	0	11025	11025	\$0	\$0	\$0
18	0	0	11025	0	11025	11025	\$0	\$0	\$0
19	0	0	11025	0	11025	11025	\$0	\$0	\$0
20	0	0	11025	0	11025	11025	\$0	\$0	\$0
21	0	0	7875	0	7875	7875	\$0	\$0	\$0
22	0	0	5250	0	5250	5250	\$0	\$0	\$0
23	0	0	2625	0	2625	2625	\$0	\$0	\$0
Totals	11025	0	22650	0	22650	22650	\$0	\$0	\$0

Impacts and Savings																																								
Year	Electric Impacts/Savings										Gas Impacts/Savings																													
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)					Per Participant					Cumulative					Yearly Incremental														
	kW	kWh (kwh)	Summer Con (kW)	Summer Con (kwh)	Winter Con (kW)	Winter Con (kwh)	CO ₂	CO ₂ (kwh)	kW	kWh (kwh)	Summer Con (kW)	Summer Con (kwh)	Winter Con (kW)	Winter Con (kwh)	CO ₂	CO ₂ (kwh)	kW	kWh (kwh)	Summer Con (kW)	Summer Con (kwh)	Winter Con (kW)	Winter Con (kwh)	CO ₂	CO ₂ (kwh)	kW	kWh (kwh)	Summer Con (kW)	Summer Con (kwh)	Winter Con (kW)	Winter Con (kwh)	CO ₂	CO ₂ (kwh)								
1	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	2,500	2,500	2,500	2,500	0	0	0	0	2,083	2,083	2,083	2,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
2	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	4,582	4,582	4,582	4,582	0	0	0	0	2,083	2,083	2,083	2,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
3	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	6,665	6,665	6,665	6,665	0	0	0	0	2,083	2,083	2,083	2,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
4	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	2,083	2,083	2,083	2,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	8,748	8,748	8,748	8,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	6,249	6,249	6,249	6,249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	4,166	4,166	4,166	4,166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	2,083	2,083	2,083	2,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals																																								

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Investment	Other	Total	kWh	kWh/line	kWh/mile	CCF	CCF/line
1	\$235,705	\$912,138	\$3,064,668	\$422,395	\$4,534,897	\$1,814	\$1,814	\$0	\$0	\$0
2	\$250,060	\$753,225	\$3,404,167	\$488,993	\$4,912,445	\$1,072	\$1,072	\$0	\$0	\$0
3	\$250,863	\$827,336	\$3,613,583	\$547,364	\$5,239,146	\$786	\$786	\$0	\$0	\$0
4	\$265,121	\$869,057	\$3,826,408	\$607,048	\$5,567,634	\$636	\$636	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$987,749	\$3,291,756	\$13,908,816	\$2,065,800	\$20,254,121	\$4,309	\$4,309	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas	Total
1	\$0	\$249,753	\$0	\$0	\$249,753	\$0	\$0	\$0	\$0
2	\$0	\$472,532	\$0	\$0	\$472,532	\$0	\$0	\$0	\$0
3	\$0	\$709,313	\$0	\$0	\$709,313	\$0	\$0	\$0	\$0
4	\$0	\$960,765	\$0	\$0	\$960,765	\$0	\$0	\$0	\$0
5	\$0	\$991,509	\$0	\$0	\$991,509	\$0	\$0	\$0	\$0
6	\$0	\$1,023,237	\$0	\$0	\$1,023,237	\$0	\$0	\$0	\$0
7	\$0	\$1,055,981	\$0	\$0	\$1,055,981	\$0	\$0	\$0	\$0
8	\$0	\$1,089,772	\$0	\$0	\$1,089,772	\$0	\$0	\$0	\$0
9	\$0	\$1,124,645	\$0	\$0	\$1,124,645	\$0	\$0	\$0	\$0
10	\$0	\$1,160,634	\$0	\$0	\$1,160,634	\$0	\$0	\$0	\$0
11	\$0	\$1,197,774	\$0	\$0	\$1,197,774	\$0	\$0	\$0	\$0
12	\$0	\$1,236,103	\$0	\$0	\$1,236,103	\$0	\$0	\$0	\$0
13	\$0	\$1,275,658	\$0	\$0	\$1,275,658	\$0	\$0	\$0	\$0
14	\$0	\$1,316,479	\$0	\$0	\$1,316,479	\$0	\$0	\$0	\$0
15	\$0	\$1,358,607	\$0	\$0	\$1,358,607	\$0	\$0	\$0	\$0
16	\$0	\$1,402,082	\$0	\$0	\$1,402,082	\$0	\$0	\$0	\$0
17	\$0	\$1,446,949	\$0	\$0	\$1,446,949	\$0	\$0	\$0	\$0
18	\$0	\$1,493,251	\$0	\$0	\$1,493,251	\$0	\$0	\$0	\$0
19	\$0	\$1,541,035	\$0	\$0	\$1,541,035	\$0	\$0	\$0	\$0
20	\$0	\$1,590,348	\$0	\$0	\$1,590,348	\$0	\$0	\$0	\$0
21	\$0	\$1,722,314	\$0	\$0	\$1,722,314	\$0	\$0	\$0	\$0
22	\$0	\$806,552	\$0	\$0	\$806,552	\$0	\$0	\$0	\$0
23	\$0	\$416,181	\$0	\$0	\$416,181	\$0	\$0	\$0	\$0
Totals	\$0	\$25,091,474	\$0	\$0	\$25,091,474	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas	Total
1	\$0	\$249,753	\$0	\$0	\$249,753	\$0	\$0	\$0	\$0
2	\$0	\$472,532	\$0	\$0	\$472,532	\$0	\$0	\$0	\$0
3	\$0	\$709,313	\$0	\$0	\$709,313	\$0	\$0	\$0	\$0
4	\$0	\$960,765	\$0	\$0	\$960,765	\$0	\$0	\$0	\$0
5	\$0	\$991,509	\$0	\$0	\$991,509	\$0	\$0	\$0	\$0
6	\$0	\$1,023,237	\$0	\$0	\$1,023,237	\$0	\$0	\$0	\$0
7	\$0	\$1,055,981	\$0	\$0	\$1,055,981	\$0	\$0	\$0	\$0
8	\$0	\$1,089,772	\$0	\$0	\$1,089,772	\$0	\$0	\$0	\$0
9	\$0	\$1,124,645	\$0	\$0	\$1,124,645	\$0	\$0	\$0	\$0
10	\$0	\$1,160,634	\$0	\$0	\$1,160,634	\$0	\$0	\$0	\$0
11	\$0	\$1,197,774	\$0	\$0	\$1,197,774	\$0	\$0	\$0	\$0
12	\$0	\$1,236,103	\$0	\$0	\$1,236,103	\$0	\$0	\$0	\$0
13	\$0	\$1,275,658	\$0	\$0	\$1,275,658	\$0	\$0	\$0	\$0
14	\$0	\$1,316,479	\$0	\$0	\$1,316,479	\$0	\$0	\$0	\$0
15	\$0	\$1,358,607	\$0	\$0	\$1,358,607	\$0	\$0	\$0	\$0
16	\$0	\$1,402,082	\$0	\$0	\$1,402,082	\$0	\$0	\$0	\$0
17	\$0	\$1,446,949	\$0	\$0	\$1,446,949	\$0	\$0	\$0	\$0
18	\$0	\$1,493,251	\$0	\$0	\$1,493,251	\$0	\$0	\$0	\$0
19	\$0	\$1,541,035	\$0	\$0	\$1,541,035	\$0	\$0	\$0	\$0
20	\$0	\$1,590,348	\$0	\$0	\$1,590,348	\$0	\$0	\$0	\$0
21	\$0	\$1,722,314	\$0	\$0	\$1,722,314	\$0	\$0	\$0	\$0
22	\$0	\$806,552	\$0	\$0	\$806,552	\$0	\$0	\$0	\$0
23	\$0	\$416,181	\$0	\$0	\$416,181	\$0	\$0	\$0	\$0
Totals	\$0	\$25,091,474	\$0	\$0	\$25,091,474	\$0	\$0	\$0	\$0

Participation and Total Participant Costs				Participation			Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net New Riders)	One-Time Investment	Annual Investment	Total Cost
1	3900	0	3900	0	3900	3900	\$0	\$0	\$0
2	3250	0	7150	0	7150	7150	\$0	\$0	\$0
3	3250	0	10400	0	10400	10400	\$0	\$0	\$0
4	3250	0	13650	0	13650	13650	\$0	\$0	\$0
5	0	0	13650	0	13650	13650	\$0	\$0	\$0
6	0	0	13650	0	13650	13650	\$0	\$0	\$0
7	0	0	13650	0	13650	13650	\$0	\$0	\$0
8	0	0	13650	0	13650	13650	\$0	\$0	\$0
9	0	0	13650	0	13650	13650	\$0	\$0	\$0
10	0	0	13650	0	13650	13650	\$0	\$0	\$0
11	0	0	13650	0	13650	13650	\$0	\$0	\$0
12	0	0	13650	0	13650	13650	\$0	\$0	\$0
13	0	0	13650	0	13650	13650	\$0	\$0	\$0
14	0	0	13650	0	13650	13650	\$0	\$0	\$0
15	0	0	13650	0	13650	13650	\$0	\$0	\$0
16	0	0	13650	0	13650	13650	\$0	\$0	\$0
17	0	0	13650	0	13650	13650	\$0	\$0	\$0
18	0	0	13650	0	13650	13650	\$0	\$0	\$0
19	0	0	13650	0	13650	13650	\$0	\$0	\$0
20	0	0	13650	0	13650	13650	\$0	\$0	\$0
21	0	0	9750	0	9750	9750	\$0	\$0	\$0
22	0	0	6500	0	6500	6500	\$0	\$0	\$0
23	0	0	3250	0	3250	3250	\$0	\$0	\$0
Total	13650	0	273000	0	273000	273000	\$0	\$0	\$0

Impacts and Savings																				
Electric Impacts/Savings																				
Year	Per Participant										Cumulative									
	kW	kWh (est)	Summer Cost kW	Summer Cost (est)	Winter Cost kW	Winter Cost (est)	kWh	kWh (est)	kWh	kWh (est)	Summer Cost kW	Summer Cost (est)	Winter Cost kW	Winter Cost (est)	kWh	kWh (est)	kWh	kWh (est)	CCF (est)	CCF (est)
1	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	3,095	3,095	3,095	0	0	0	0	0	0	0	
2	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	5,674	5,674	5,674	0	0	0	0	0	0	0	
3	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	8,252	8,252	8,252	0	0	0	0	0	0	0	
4	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
5	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
6	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
7	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
9	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
10	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
11	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
12	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
13	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
14	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
15	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
16	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
17	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
18	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
19	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
20	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,831	10,831	10,831	0	0	0	0	0	0	0	
21	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	7,737	7,737	7,737	0	0	0	0	0	0	0	
22	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	5,158	5,158	5,158	0	0	0	0	0	0	0	
23	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	2,579	2,579	2,579	0	0	0	0	0	0	0	
Total																				

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Operations	Other	Total	kWh	kWh/line	kWh/mile	CCF	CCF/line
1	\$291,826	\$1,005,504	\$109,449	\$622,966	\$1,929,744	\$624	\$624	\$0	\$0	\$0
2	\$292,265	\$969,707	\$115,332	\$605,620	\$1,982,724	\$349	\$349	\$0	\$0	\$0
3	\$310,592	\$1,024,321	\$119,439	\$677,689	\$2,132,041	\$258	\$258	\$0	\$0	\$0
4	\$328,245	\$1,079,376	\$140,574	\$751,583	\$2,299,777	\$212	\$212	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$1,222,927	\$4,075,508	\$484,794	\$2,557,657	\$8,340,887	\$1,443	\$1,443	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenarios										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$309,217	\$0	\$0	\$309,217	\$0	\$0	\$0	\$0	\$0
2	\$0	\$585,039	\$0	\$0	\$585,039	\$0	\$0	\$0	\$0	\$0
3	\$0	\$878,197	\$0	\$0	\$878,197	\$0	\$0	\$0	\$0	\$0
4	\$0	\$1,189,518	\$0	\$0	\$1,189,518	\$0	\$0	\$0	\$0	\$0
5	\$0	\$1,227,583	\$0	\$0	\$1,227,583	\$0	\$0	\$0	\$0	\$0
6	\$0	\$1,266,865	\$0	\$0	\$1,266,865	\$0	\$0	\$0	\$0	\$0
7	\$0	\$1,307,405	\$0	\$0	\$1,307,405	\$0	\$0	\$0	\$0	\$0
8	\$0	\$1,349,242	\$0	\$0	\$1,349,242	\$0	\$0	\$0	\$0	\$0
9	\$0	\$1,392,418	\$0	\$0	\$1,392,418	\$0	\$0	\$0	\$0	\$0
10	\$0	\$1,436,975	\$0	\$0	\$1,436,975	\$0	\$0	\$0	\$0	\$0
11	\$0	\$1,482,958	\$0	\$0	\$1,482,958	\$0	\$0	\$0	\$0	\$0
12	\$0	\$1,530,413	\$0	\$0	\$1,530,413	\$0	\$0	\$0	\$0	\$0
13	\$0	\$1,579,386	\$0	\$0	\$1,579,386	\$0	\$0	\$0	\$0	\$0
14	\$0	\$1,629,927	\$0	\$0	\$1,629,927	\$0	\$0	\$0	\$0	\$0
15	\$0	\$1,682,084	\$0	\$0	\$1,682,084	\$0	\$0	\$0	\$0	\$0
16	\$0	\$1,735,911	\$0	\$0	\$1,735,911	\$0	\$0	\$0	\$0	\$0
17	\$0	\$1,791,460	\$0	\$0	\$1,791,460	\$0	\$0	\$0	\$0	\$0
18	\$0	\$1,848,787	\$0	\$0	\$1,848,787	\$0	\$0	\$0	\$0	\$0
19	\$0	\$1,907,948	\$0	\$0	\$1,907,948	\$0	\$0	\$0	\$0	\$0
20	\$0	\$1,969,002	\$0	\$0	\$1,969,002	\$0	\$0	\$0	\$0	\$0
21	\$0	\$1,451,436	\$0	\$0	\$1,451,436	\$0	\$0	\$0	\$0	\$0
22	\$0	\$998,588	\$0	\$0	\$998,588	\$0	\$0	\$0	\$0	\$0
23	\$0	\$515,271	\$0	\$0	\$515,271	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$31,065,634	\$0	\$0	\$31,065,634	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$309,217	\$0	\$0	\$309,217	\$0	\$0	\$0	\$0	\$0
2	\$0	\$585,039	\$0	\$0	\$585,039	\$0	\$0	\$0	\$0	\$0
3	\$0	\$878,197	\$0	\$0	\$878,197	\$0	\$0	\$0	\$0	\$0
4	\$0	\$1,189,518	\$0	\$0	\$1,189,518	\$0	\$0	\$0	\$0	\$0
5	\$0	\$1,227,583	\$0	\$0	\$1,227,583	\$0	\$0	\$0	\$0	\$0
6	\$0	\$1,266,865	\$0	\$0	\$1,266,865	\$0	\$0	\$0	\$0	\$0
7	\$0	\$1,307,405	\$0	\$0	\$1,307,405	\$0	\$0	\$0	\$0	\$0
8	\$0	\$1,349,242	\$0	\$0	\$1,349,242	\$0	\$0	\$0	\$0	\$0
9	\$0	\$1,392,418	\$0	\$0	\$1,392,418	\$0	\$0	\$0	\$0	\$0
10	\$0	\$1,436,975	\$0	\$0	\$1,436,975	\$0	\$0	\$0	\$0	\$0
11	\$0	\$1,482,958	\$0	\$0	\$1,482,958	\$0	\$0	\$0	\$0	\$0
12	\$0	\$1,530,413	\$0	\$0	\$1,530,413	\$0	\$0	\$0	\$0	\$0
13	\$0	\$1,579,386	\$0	\$0	\$1,579,386	\$0	\$0	\$0	\$0	\$0
14	\$0	\$1,629,927	\$0	\$0	\$1,629,927	\$0	\$0	\$0	\$0	\$0
15	\$0	\$1,682,084	\$0	\$0	\$1,682,084	\$0	\$0	\$0	\$0	\$0
16	\$0	\$1,735,911	\$0	\$0	\$1,735,911	\$0	\$0	\$0	\$0	\$0
17	\$0	\$1,791,460	\$0	\$0	\$1,791,460	\$0	\$0	\$0	\$0	\$0
18	\$0	\$1,848,787	\$0	\$0	\$1,848,787	\$0	\$0	\$0	\$0	\$0
19	\$0	\$1,907,948	\$0	\$0	\$1,907,948	\$0	\$0	\$0	\$0	\$0
20	\$0	\$1,969,002	\$0	\$0	\$1,969,002	\$0	\$0	\$0	\$0	\$0
21	\$0	\$1,451,436	\$0	\$0	\$1,451,436	\$0	\$0	\$0	\$0	\$0
22	\$0	\$998,588	\$0	\$0	\$998,588	\$0	\$0	\$0	\$0	\$0
23	\$0	\$515,271	\$0	\$0	\$515,271	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$31,065,634	\$0	\$0	\$31,065,634	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (Net/Free Riders)	Participants (Net/Free Riders)	One-Time Investment	Annual	Total Costs
1	3900	0	3900	0	3900	3900	\$0	\$0	\$0
2	3250	0	7150	0	7150	7150	\$0	\$0	\$0
3	3250	0	10400	0	10400	10400	\$0	\$0	\$0
4	3250	0	13650	0	13650	13650	\$0	\$0	\$0
5	0	0	13650	0	13650	13650	\$0	\$0	\$0
6	0	0	13650	0	13650	13650	\$0	\$0	\$0
7	0	0	13650	0	13650	13650	\$0	\$0	\$0
8	0	0	13650	0	13650	13650	\$0	\$0	\$0
9	0	0	13650	0	13650	13650	\$0	\$0	\$0
10	0	0	13650	0	13650	13650	\$0	\$0	\$0
11	0	0	13650	0	13650	13650	\$0	\$0	\$0
12	0	0	13650	0	13650	13650	\$0	\$0	\$0
13	0	0	13650	0	13650	13650	\$0	\$0	\$0
14	0	0	13650	0	13650	13650	\$0	\$0	\$0
15	0	0	13650	0	13650	13650	\$0	\$0	\$0
16	0	0	13650	0	13650	13650	\$0	\$0	\$0
17	0	0	13650	0	13650	13650	\$0	\$0	\$0
18	0	0	13650	0	13650	13650	\$0	\$0	\$0
19	0	0	13650	0	13650	13650	\$0	\$0	\$0
20	0	0	13650	0	13650	13650	\$0	\$0	\$0
21	0	0	9750	0	9750	9750	\$0	\$0	\$0
22	0	0	6500	0	6500	6500	\$0	\$0	\$0
23	0	0	3250	0	3250	3250	\$0	\$0	\$0
Totals	13650	0	273000	0	273000	273000	\$0	\$0	\$0

Impacts and Savings																					
Year	Electric Impacts/Savings										Gas Impacts/Savings										
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)						Per Participant				
	kW	kWh (net)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)						
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals																					

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue					
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant
1	\$33	\$32	\$65	\$126,869	\$125,049	\$251,918	\$126,869	\$60,231	\$187,100
2	\$33	\$33	\$66	\$237,245	\$233,642	\$471,087	\$237,245	\$110,424	\$347,669
3	\$34	\$33	\$67	\$351,086	\$346,036	\$698,521	\$351,086	\$160,816	\$512,802
4	\$35	\$34	\$69	\$471,221	\$464,460	\$935,681	\$471,221	\$210,809	\$682,029
5	\$35	\$35	\$70	\$480,845	\$473,749	\$954,594	\$480,845	\$210,809	\$691,454
6	\$36	\$35	\$71	\$490,258	\$483,224	\$973,482	\$490,258	\$210,809	\$701,067
7	\$37	\$36	\$73	\$500,063	\$492,889	\$992,952	\$500,063	\$210,809	\$710,872
8	\$37	\$37	\$74	\$510,064	\$502,747	\$1,012,811	\$510,064	\$210,809	\$720,873
9	\$38	\$38	\$76	\$520,266	\$512,802	\$1,033,067	\$520,266	\$210,809	\$731,074
10	\$39	\$38	\$77	\$530,671	\$523,058	\$1,053,729	\$530,671	\$210,809	\$741,480
11	\$40	\$39	\$79	\$541,284	\$533,519	\$1,074,803	\$541,284	\$210,809	\$752,093
12	\$40	\$40	\$80	\$552,110	\$544,189	\$1,096,299	\$552,110	\$210,809	\$762,919
13	\$41	\$41	\$82	\$563,152	\$555,073	\$1,118,225	\$563,152	\$210,809	\$773,961
14	\$42	\$41	\$84	\$574,415	\$566,174	\$1,140,590	\$574,415	\$210,809	\$785,224
15	\$43	\$42	\$85	\$585,904	\$577,498	\$1,163,402	\$585,904	\$210,809	\$796,712
16	\$44	\$43	\$87	\$597,622	\$589,048	\$1,186,670	\$597,622	\$210,809	\$808,430
17	\$45	\$44	\$89	\$609,574	\$600,829	\$1,210,403	\$609,574	\$210,809	\$820,383
18	\$46	\$45	\$90	\$621,766	\$612,845	\$1,234,611	\$621,766	\$210,809	\$832,674
19	\$46	\$46	\$92	\$634,201	\$625,102	\$1,259,303	\$634,201	\$210,809	\$845,010
20	\$47	\$47	\$94	\$646,885	\$637,604	\$1,284,489	\$646,885	\$210,809	\$857,694
21	\$48	\$48	\$96	\$659,822	\$650,342	\$1,310,131	\$659,822	\$210,809	\$870,721
22	\$49	\$49	\$98	\$673,025	\$663,327	\$1,336,458	\$673,025	\$210,809	\$884,100
23	\$50	\$50	\$100	\$686,497	\$676,568	\$1,363,466	\$686,497	\$210,809	\$897,831
Totals	\$938	\$925	\$1,863	\$11,101,434	\$10,942,169	\$22,043,603	\$11,101,434	\$4,215,173	\$15,317,607

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF	\$/CCF	
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TCO	Arbitrary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$145,127	\$0	\$0	\$0	\$145,127	\$0	\$66,827	\$66,827	\$0	\$66,827
2	\$274,580	\$0	\$0	\$0	\$274,580	\$0	\$127,172	\$127,172	\$0	\$127,172
3	\$412,169	\$0	\$0	\$0	\$412,169	\$0	\$192,007	\$192,007	\$0	\$192,007
4	\$558,283	\$0	\$0	\$0	\$558,283	\$0	\$261,586	\$261,586	\$0	\$261,586
5	\$576,148	\$0	\$0	\$0	\$576,148	\$0	\$271,526	\$271,526	\$0	\$271,526
6	\$594,585	\$0	\$0	\$0	\$594,585	\$0	\$281,844	\$281,844	\$0	\$281,844
7	\$613,611	\$0	\$0	\$0	\$613,611	\$0	\$292,554	\$292,554	\$0	\$292,554
8	\$633,247	\$0	\$0	\$0	\$633,247	\$0	\$303,671	\$303,671	\$0	\$303,671
9	\$653,511	\$0	\$0	\$0	\$653,511	\$0	\$315,210	\$315,210	\$0	\$315,210
10	\$674,423	\$0	\$0	\$0	\$674,423	\$0	\$327,188	\$327,188	\$0	\$327,188
11	\$696,005	\$0	\$0	\$0	\$696,005	\$0	\$339,622	\$339,622	\$0	\$339,622
12	\$718,277	\$0	\$0	\$0	\$718,277	\$0	\$352,527	\$352,527	\$0	\$352,527
13	\$741,262	\$0	\$0	\$0	\$741,262	\$0	\$365,923	\$365,923	\$0	\$365,923
14	\$764,982	\$0	\$0	\$0	\$764,982	\$0	\$379,828	\$379,828	\$0	\$379,828
15	\$789,461	\$0	\$0	\$0	\$789,461	\$0	\$394,262	\$394,262	\$0	\$394,262
16	\$814,724	\$0	\$0	\$0	\$814,724	\$0	\$409,244	\$409,244	\$0	\$409,244
17	\$840,795	\$0	\$0	\$0	\$840,795	\$0	\$424,795	\$424,795	\$0	\$424,795
18	\$867,701	\$0	\$0	\$0	\$867,701	\$0	\$440,937	\$440,937	\$0	\$440,937
19	\$895,467	\$0	\$0	\$0	\$895,467	\$0	\$457,693	\$457,693	\$0	\$457,693
20	\$924,122	\$0	\$0	\$0	\$924,122	\$0	\$475,085	\$475,085	\$0	\$475,085
21	\$681,210	\$0	\$0	\$0	\$681,210	\$0	\$352,242	\$352,242	\$0	\$352,242
22	\$468,673	\$0	\$0	\$0	\$468,673	\$0	\$243,751	\$243,751	\$0	\$243,751
23	\$241,835	\$0	\$0	\$0	\$241,835	\$0	\$126,507	\$126,507	\$0	\$126,507
Totals	\$14,580,197	\$0	\$0	\$0	\$14,580,197	\$0	\$7,202,000	\$7,202,000	\$0	\$7,202,000

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TCO	Arbitrary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$145,127	\$0	\$0	\$0	\$145,127	\$0	\$66,827	\$66,827	\$0	\$66,827
2	\$274,580	\$0	\$0	\$0	\$274,580	\$0	\$127,172	\$127,172	\$0	\$127,172
3	\$412,169	\$0	\$0	\$0	\$412,169	\$0	\$192,007	\$192,007	\$0	\$192,007
4	\$558,283	\$0	\$0	\$0	\$558,283	\$0	\$261,586	\$261,586	\$0	\$261,586
5	\$576,148	\$0	\$0	\$0	\$576,148	\$0	\$271,526	\$271,526	\$0	\$271,526
6	\$594,585	\$0	\$0	\$0	\$594,585	\$0	\$281,844	\$281,844	\$0	\$281,844
7	\$613,611	\$0	\$0	\$0	\$613,611	\$0	\$292,554	\$292,554	\$0	\$292,554
8	\$633,247	\$0	\$0	\$0	\$633,247	\$0	\$303,671	\$303,671	\$0	\$303,671
9	\$653,511	\$0	\$0	\$0	\$653,511	\$0	\$315,210	\$315,210	\$0	\$315,210
10	\$674,423	\$0	\$0	\$0	\$674,423	\$0	\$327,188	\$327,188	\$0	\$327,188
11	\$696,005	\$0	\$0	\$0	\$696,005	\$0	\$339,622	\$339,622	\$0	\$339,622
12	\$718,277	\$0	\$0	\$0	\$718,277	\$0	\$352,527	\$352,527	\$0	\$352,527
13	\$741,262	\$0	\$0	\$0	\$741,262	\$0	\$365,923	\$365,923	\$0	\$365,923
14	\$764,982	\$0	\$0	\$0	\$764,982	\$0	\$379,828	\$379,828	\$0	\$379,828
15	\$789,461	\$0	\$0	\$0	\$789,461	\$0	\$394,262	\$394,262	\$0	\$394,262
16	\$814,724	\$0	\$0	\$0	\$814,724	\$0	\$409,244	\$409,244	\$0	\$409,244
17	\$840,795	\$0	\$0	\$0	\$840,795	\$0	\$424,795	\$424,795	\$0	\$424,795
18	\$867,701	\$0	\$0	\$0	\$867,701	\$0	\$440,937	\$440,937	\$0	\$440,937
19	\$895,467	\$0	\$0	\$0	\$895,467	\$0	\$457,693	\$457,693	\$0	\$457,693
20	\$924,122	\$0	\$0	\$0	\$924,122	\$0	\$475,085	\$475,085	\$0	\$475,085
21	\$681,210	\$0	\$0	\$0	\$681,210	\$0	\$352,242	\$352,242	\$0	\$352,242
22	\$468,673	\$0	\$0	\$0	\$468,673	\$0	\$243,751	\$243,751	\$0	\$243,751
23	\$241,835	\$0	\$0	\$0	\$241,835	\$0	\$126,507	\$126,507	\$0	\$126,507
Totals	\$14,580,197	\$0	\$0	\$0	\$14,580,197	\$0	\$7,202,000	\$7,202,000	\$0	\$7,202,000

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (Net/Free Riders)	Participants (Net/Free Riders)	One-Time Investment	Annual	Total Costs
1	3150	0	3150	0	3150	3150	\$0	\$0	\$0
2	2625	0	5775	0	5775	5775	\$0	\$0	\$0
3	2625	0	8400	0	8400	8400	\$0	\$0	\$0
4	2625	0	11025	0	11025	11025	\$0	\$0	\$0
5	0	0	11025	0	11025	11025	\$0	\$0	\$0
6	0	0	11025	0	11025	11025	\$0	\$0	\$0
7	0	0	11025	0	11025	11025	\$0	\$0	\$0
8	0	0	11025	0	11025	11025	\$0	\$0	\$0
9	0	0	11025	0	11025	11025	\$0	\$0	\$0
10	0	0	11025	0	11025	11025	\$0	\$0	\$0
11	0	0	11025	0	11025	11025	\$0	\$0	\$0
12	0	0	11025	0	11025	11025	\$0	\$0	\$0
13	0	0	11025	0	11025	11025	\$0	\$0	\$0
14	0	0	11025	0	11025	11025	\$0	\$0	\$0
15	0	0	11025	0	11025	11025	\$0	\$0	\$0
16	0	0	11025	0	11025	11025	\$0	\$0	\$0
17	0	0	11025	0	11025	11025	\$0	\$0	\$0
18	0	0	11025	0	11025	11025	\$0	\$0	\$0
19	0	0	11025	0	11025	11025	\$0	\$0	\$0
20	0	0	11025	0	11025	11025	\$0	\$0	\$0
21	0	0	7875	0	7875	7875	\$0	\$0	\$0
22	0	0	5250	0	5250	5250	\$0	\$0	\$0
23	0	0	2625	0	2625	2625	\$0	\$0	\$0
Totals	11025	0	22650	0	22650	22650	\$0	\$0	\$0

Impacts and Savings																																						
Year	Electric Impacts/Savings														Gas Impacts/Savings																							
	Cumulative														Yearly Incremental (Per Participant * Incremental Participants)																							
	Per Participant		Summer Con LW		Summer Con (net)		Winter Con LW		Winter Con (net)		VWH		VWH (net)		LW		LW (net)		Summer Con LW		Summer Con (net)		Winter Con LW		Winter Con (net)		VWH		VWH (net)		COF		COF (net)		COF		COF (net)	
1	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,509	2,509	2,509	2,509	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8,781	8,781	8,781	8,781	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15,062	15,062	15,062	15,062	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21,323	21,323	21,323	21,323	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27,584	27,584	27,584	27,584	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33,845	33,845	33,845	33,845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40,106	40,106	40,106	40,106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46,367	46,367	46,367	46,367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52,628	52,628	52,628	52,628	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58,889	58,889	58,889	58,889	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65,150	65,150	65,150	65,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71,411	71,411	71,411	71,411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77,672	77,672	77,672	77,672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83,933	83,933	83,933	83,933	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90,194	90,194	90,194	90,194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96,455	96,455	96,455	96,455	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	102,716	102,716	102,716	102,716	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108,977	108,977	108,977	108,977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	115,238	115,238	115,238	115,238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	121,499	121,499	121,499	121,499	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	127,760	127,760	127,760	127,760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134,021	134,021	134,021	134,021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140,282	140,282	140,282	140,282	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals																																						

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF
1	\$224,387	\$773,139	\$2,917,495	\$402,112	\$4,317,134	\$1,721	\$1,721	\$0	\$0	\$0
2	\$223,147	\$740,381	\$3,217,952	\$462,244	\$4,643,724	\$1,010	\$1,010	\$0	\$0	\$0
3	\$236,640	\$780,431	\$3,408,715	\$516,332	\$4,942,119	\$739	\$739	\$0	\$0	\$0
4	\$249,660	\$816,376	\$3,603,259	\$571,646	\$5,242,940	\$597	\$597	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$933,834	\$3,112,327	\$13,147,422	\$1,952,334	\$19,145,917	\$4,068	\$4,068	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas	Total
1	\$0	\$250,697	\$0	\$0	\$250,697	\$0	\$0	\$0	\$0
2	\$0	\$474,318	\$0	\$0	\$474,318	\$0	\$0	\$0	\$0
3	\$0	\$711,995	\$0	\$0	\$711,995	\$0	\$0	\$0	\$0
4	\$0	\$964,397	\$0	\$0	\$964,397	\$0	\$0	\$0	\$0
5	\$0	\$995,258	\$0	\$0	\$995,258	\$0	\$0	\$0	\$0
6	\$0	\$1,027,106	\$0	\$0	\$1,027,106	\$0	\$0	\$0	\$0
7	\$0	\$1,059,973	\$0	\$0	\$1,059,973	\$0	\$0	\$0	\$0
8	\$0	\$1,093,893	\$0	\$0	\$1,093,893	\$0	\$0	\$0	\$0
9	\$0	\$1,128,897	\$0	\$0	\$1,128,897	\$0	\$0	\$0	\$0
10	\$0	\$1,165,022	\$0	\$0	\$1,165,022	\$0	\$0	\$0	\$0
11	\$0	\$1,202,303	\$0	\$0	\$1,202,303	\$0	\$0	\$0	\$0
12	\$0	\$1,240,776	\$0	\$0	\$1,240,776	\$0	\$0	\$0	\$0
13	\$0	\$1,280,481	\$0	\$0	\$1,280,481	\$0	\$0	\$0	\$0
14	\$0	\$1,321,456	\$0	\$0	\$1,321,456	\$0	\$0	\$0	\$0
15	\$0	\$1,363,743	\$0	\$0	\$1,363,743	\$0	\$0	\$0	\$0
16	\$0	\$1,407,383	\$0	\$0	\$1,407,383	\$0	\$0	\$0	\$0
17	\$0	\$1,452,419	\$0	\$0	\$1,452,419	\$0	\$0	\$0	\$0
18	\$0	\$1,498,897	\$0	\$0	\$1,498,897	\$0	\$0	\$0	\$0
19	\$0	\$1,546,861	\$0	\$0	\$1,546,861	\$0	\$0	\$0	\$0
20	\$0	\$1,596,361	\$0	\$0	\$1,596,361	\$0	\$0	\$0	\$0
21	\$0	\$1,776,746	\$0	\$0	\$1,776,746	\$0	\$0	\$0	\$0
22	\$0	\$809,601	\$0	\$0	\$809,601	\$0	\$0	\$0	\$0
23	\$0	\$417,754	\$0	\$0	\$417,754	\$0	\$0	\$0	\$0
Totals	\$0	\$25,186,338	\$0	\$0	\$25,186,338	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas	Total
1	\$0	\$250,697	\$0	\$0	\$250,697	\$0	\$0	\$0	\$0
2	\$0	\$474,318	\$0	\$0	\$474,318	\$0	\$0	\$0	\$0
3	\$0	\$711,995	\$0	\$0	\$711,995	\$0	\$0	\$0	\$0
4	\$0	\$964,397	\$0	\$0	\$964,397	\$0	\$0	\$0	\$0
5	\$0	\$995,258	\$0	\$0	\$995,258	\$0	\$0	\$0	\$0
6	\$0	\$1,027,106	\$0	\$0	\$1,027,106	\$0	\$0	\$0	\$0
7	\$0	\$1,059,973	\$0	\$0	\$1,059,973	\$0	\$0	\$0	\$0
8	\$0	\$1,093,893	\$0	\$0	\$1,093,893	\$0	\$0	\$0	\$0
9	\$0	\$1,128,897	\$0	\$0	\$1,128,897	\$0	\$0	\$0	\$0
10	\$0	\$1,165,022	\$0	\$0	\$1,165,022	\$0	\$0	\$0	\$0
11	\$0	\$1,202,303	\$0	\$0	\$1,202,303	\$0	\$0	\$0	\$0
12	\$0	\$1,240,776	\$0	\$0	\$1,240,776	\$0	\$0	\$0	\$0
13	\$0	\$1,280,481	\$0	\$0	\$1,280,481	\$0	\$0	\$0	\$0
14	\$0	\$1,321,456	\$0	\$0	\$1,321,456	\$0	\$0	\$0	\$0
15	\$0	\$1,363,743	\$0	\$0	\$1,363,743	\$0	\$0	\$0	\$0
16	\$0	\$1,407,383	\$0	\$0	\$1,407,383	\$0	\$0	\$0	\$0
17	\$0	\$1,452,419	\$0	\$0	\$1,452,419	\$0	\$0	\$0	\$0
18	\$0	\$1,498,897	\$0	\$0	\$1,498,897	\$0	\$0	\$0	\$0
19	\$0	\$1,546,861	\$0	\$0	\$1,546,861	\$0	\$0	\$0	\$0
20	\$0	\$1,596,361	\$0	\$0	\$1,596,361	\$0	\$0	\$0	\$0
21	\$0	\$1,776,746	\$0	\$0	\$1,776,746	\$0	\$0	\$0	\$0
22	\$0	\$809,601	\$0	\$0	\$809,601	\$0	\$0	\$0	\$0
23	\$0	\$417,754	\$0	\$0	\$417,754	\$0	\$0	\$0	\$0
Totals	\$0	\$25,186,338	\$0	\$0	\$25,186,338	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual Investment	Total Costs
1	3900	0	3900	0	3900	0	\$0	\$0	\$0
2	3250	0	7150	0	7150	0	\$0	\$0	\$0
3	3250	0	10400	0	10400	0	\$0	\$0	\$0
4	3250	0	13650	0	13650	0	\$0	\$0	\$0
5	0	0	13650	0	13650	0	\$0	\$0	\$0
6	0	0	13650	0	13650	0	\$0	\$0	\$0
7	0	0	13650	0	13650	0	\$0	\$0	\$0
8	0	0	13650	0	13650	0	\$0	\$0	\$0
9	0	0	13650	0	13650	0	\$0	\$0	\$0
10	0	0	13650	0	13650	0	\$0	\$0	\$0
11	0	0	13650	0	13650	0	\$0	\$0	\$0
12	0	0	13650	0	13650	0	\$0	\$0	\$0
13	0	0	13650	0	13650	0	\$0	\$0	\$0
14	0	0	13650	0	13650	0	\$0	\$0	\$0
15	0	0	13650	0	13650	0	\$0	\$0	\$0
16	0	0	13650	0	13650	0	\$0	\$0	\$0
17	0	0	13650	0	13650	0	\$0	\$0	\$0
18	0	0	13650	0	13650	0	\$0	\$0	\$0
19	0	0	13650	0	13650	0	\$0	\$0	\$0
20	0	0	13650	0	13650	0	\$0	\$0	\$0
21	0	0	9750	0	9750	0	\$0	\$0	\$0
22	0	0	6500	0	6500	0	\$0	\$0	\$0
23	0	0	3250	0	3250	0	\$0	\$0	\$0
Total	13650	0	27300	0	27300	27300	\$0	\$0	\$0

Impacts and Savings																								
Year	Electric Impacts/Savings																Gas Impacts/Savings							
	Per Participant																Per Participant							
	kW	kWh (net)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)
1	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	3,106	3,106	3,106	3,106	0	0	0	0	0	0	0	0	0	0	
2	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	5,695	5,695	5,695	5,695	0	0	0	0	0	0	0	0	0	0	
3	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	8,284	8,284	8,284	8,284	0	0	0	0	0	0	0	0	0	0	
4	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
5	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
6	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
7	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
9	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
10	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
11	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
12	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
13	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
14	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
15	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
16	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
17	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
18	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
19	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
20	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	10,872	10,872	10,872	10,872	0	0	0	0	0	0	0	0	0	0	
21	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	7,766	7,766	7,766	7,766	0	0	0	0	0	0	0	0	0	0	
22	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	5,177	5,177	5,177	5,177	0	0	0	0	0	0	0	0	0	0	
23	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	2,589	2,589	2,589	2,589	0	0	0	0	0	0	0	0	0	0	
Total																								

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Freq/Parist	Net Freq/Parist	Net Freq/Parist	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Operations	Other	Total	kWh	kWh	kWh/line	CCF	CCF/line
1	\$277,812	\$957,220	\$104,193	\$497,853	\$1,837,079	\$291	\$591	\$0	\$0	\$0
2	\$276,277	\$916,862	\$109,023	\$472,302	\$1,774,465	\$329	\$529	\$0	\$0	\$0
3	\$292,983	\$966,248	\$112,668	\$639,268	\$2,011,167	\$243	\$243	\$0	\$0	\$0
4	\$309,102	\$1,013,227	\$122,376	\$707,752	\$2,162,457	\$199	\$199	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$1,156,175	\$3,853,357	\$458,260	\$2,417,175	\$7,884,969	\$1,362	\$1,362	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$310,386	\$0	\$0	\$310,386	\$0	\$0	\$0	\$0	\$0
2	\$0	\$587,251	\$0	\$0	\$587,251	\$0	\$0	\$0	\$0	\$0
3	\$0	\$861,516	\$0	\$0	\$861,516	\$0	\$0	\$0	\$0	\$0
4	\$0	\$1,194,015	\$0	\$0	\$1,194,015	\$0	\$0	\$0	\$0	\$0
5	\$0	\$1,232,224	\$0	\$0	\$1,232,224	\$0	\$0	\$0	\$0	\$0
6	\$0	\$1,271,655	\$0	\$0	\$1,271,655	\$0	\$0	\$0	\$0	\$0
7	\$0	\$1,312,348	\$0	\$0	\$1,312,348	\$0	\$0	\$0	\$0	\$0
8	\$0	\$1,354,343	\$0	\$0	\$1,354,343	\$0	\$0	\$0	\$0	\$0
9	\$0	\$1,397,682	\$0	\$0	\$1,397,682	\$0	\$0	\$0	\$0	\$0
10	\$0	\$1,442,408	\$0	\$0	\$1,442,408	\$0	\$0	\$0	\$0	\$0
11	\$0	\$1,488,565	\$0	\$0	\$1,488,565	\$0	\$0	\$0	\$0	\$0
12	\$0	\$1,536,199	\$0	\$0	\$1,536,199	\$0	\$0	\$0	\$0	\$0
13	\$0	\$1,585,358	\$0	\$0	\$1,585,358	\$0	\$0	\$0	\$0	\$0
14	\$0	\$1,636,089	\$0	\$0	\$1,636,089	\$0	\$0	\$0	\$0	\$0
15	\$0	\$1,688,444	\$0	\$0	\$1,688,444	\$0	\$0	\$0	\$0	\$0
16	\$0	\$1,742,474	\$0	\$0	\$1,742,474	\$0	\$0	\$0	\$0	\$0
17	\$0	\$1,798,233	\$0	\$0	\$1,798,233	\$0	\$0	\$0	\$0	\$0
18	\$0	\$1,855,777	\$0	\$0	\$1,855,777	\$0	\$0	\$0	\$0	\$0
19	\$0	\$1,915,162	\$0	\$0	\$1,915,162	\$0	\$0	\$0	\$0	\$0
20	\$0	\$1,976,447	\$0	\$0	\$1,976,447	\$0	\$0	\$0	\$0	\$0
21	\$0	\$1,456,924	\$0	\$0	\$1,456,924	\$0	\$0	\$0	\$0	\$0
22	\$0	\$1,002,363	\$0	\$0	\$1,002,363	\$0	\$0	\$0	\$0	\$0
23	\$0	\$517,220	\$0	\$0	\$517,220	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$31,183,085	\$0	\$0	\$31,183,085	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$310,386	\$0	\$0	\$310,386	\$0	\$0	\$0	\$0	\$0
2	\$0	\$587,251	\$0	\$0	\$587,251	\$0	\$0	\$0	\$0	\$0
3	\$0	\$861,516	\$0	\$0	\$861,516	\$0	\$0	\$0	\$0	\$0
4	\$0	\$1,194,015	\$0	\$0	\$1,194,015	\$0	\$0	\$0	\$0	\$0
5	\$0	\$1,232,224	\$0	\$0	\$1,232,224	\$0	\$0	\$0	\$0	\$0
6	\$0	\$1,271,655	\$0	\$0	\$1,271,655	\$0	\$0	\$0	\$0	\$0
7	\$0	\$1,312,348	\$0	\$0	\$1,312,348	\$0	\$0	\$0	\$0	\$0
8	\$0	\$1,354,343	\$0	\$0	\$1,354,343	\$0	\$0	\$0	\$0	\$0
9	\$0	\$1,397,682	\$0	\$0	\$1,397,682	\$0	\$0	\$0	\$0	\$0
10	\$0	\$1,442,408	\$0	\$0	\$1,442,408	\$0	\$0	\$0	\$0	\$0
11	\$0	\$1,488,565	\$0	\$0	\$1,488,565	\$0	\$0	\$0	\$0	\$0
12	\$0	\$1,536,199	\$0	\$0	\$1,536,199	\$0	\$0	\$0	\$0	\$0
13	\$0	\$1,585,358	\$0	\$0	\$1,585,358	\$0	\$0	\$0	\$0	\$0
14	\$0	\$1,636,089	\$0	\$0	\$1,636,089	\$0	\$0	\$0	\$0	\$0
15	\$0	\$1,688,444	\$0	\$0	\$1,688,444	\$0	\$0	\$0	\$0	\$0
16	\$0	\$1,742,474	\$0	\$0	\$1,742,474	\$0	\$0	\$0	\$0	\$0
17	\$0	\$1,798,233	\$0	\$0	\$1,798,233	\$0	\$0	\$0	\$0	\$0
18	\$0	\$1,855,777	\$0	\$0	\$1,855,777	\$0	\$0	\$0	\$0	\$0
19	\$0	\$1,915,162	\$0	\$0	\$1,915,162	\$0	\$0	\$0	\$0	\$0
20	\$0	\$1,976,447	\$0	\$0	\$1,976,447	\$0	\$0	\$0	\$0	\$0
21	\$0	\$1,456,924	\$0	\$0	\$1,456,924	\$0	\$0	\$0	\$0	\$0
22	\$0	\$1,002,363	\$0	\$0	\$1,002,363	\$0	\$0	\$0	\$0	\$0
23	\$0	\$517,220	\$0	\$0	\$517,220	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$31,183,085	\$0	\$0	\$31,183,085	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (Net New Adds)	Participants (Net Participants)	One-Time Investment	Annual	Total Costs
1	3900	0	3900	0	3900	3900	\$0	\$0	\$0
2	3250	0	7150	0	7150	7150	\$0	\$0	\$0
3	3250	0	10400	0	10400	10400	\$0	\$0	\$0
4	3250	0	13650	0	13650	13650	\$0	\$0	\$0
5	0	0	13650	0	13650	13650	\$0	\$0	\$0
6	0	0	13650	0	13650	13650	\$0	\$0	\$0
7	0	0	13650	0	13650	13650	\$0	\$0	\$0
8	0	0	13650	0	13650	13650	\$0	\$0	\$0
9	0	0	13650	0	13650	13650	\$0	\$0	\$0
10	0	0	13650	0	13650	13650	\$0	\$0	\$0
11	0	0	13650	0	13650	13650	\$0	\$0	\$0
12	0	0	13650	0	13650	13650	\$0	\$0	\$0
13	0	0	13650	0	13650	13650	\$0	\$0	\$0
14	0	0	13650	0	13650	13650	\$0	\$0	\$0
15	0	0	13650	0	13650	13650	\$0	\$0	\$0
16	0	0	13650	0	13650	13650	\$0	\$0	\$0
17	0	0	13650	0	13650	13650	\$0	\$0	\$0
18	0	0	13650	0	13650	13650	\$0	\$0	\$0
19	0	0	13650	0	13650	13650	\$0	\$0	\$0
20	0	0	13650	0	13650	13650	\$0	\$0	\$0
21	0	0	9750	0	9750	9750	\$0	\$0	\$0
22	0	0	6500	0	6500	6500	\$0	\$0	\$0
23	0	0	3250	0	3250	3250	\$0	\$0	\$0
Totals	13650	0	273000	0	273000	273000	\$0	\$0	\$0

Impacts and Savings																				
Year	Electric Impacts/Savings										Gas Impacts/Savings									
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)									
	kW	kWh (kwh)	Summer Con kW	Summer Con kWh	Winter Con kW	Winter Con kWh	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)	CO2 (t/yr)					
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals																				

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Fuel	Net Fuel	Net Fuel
1	\$31	\$32	\$63	\$120,052	\$125,049	\$245,101	\$120,052	\$60,231	\$180,283
2	\$31	\$33	\$64	\$224,497	\$233,842	\$458,339	\$224,497	\$110,424	\$334,920
3	\$32	\$33	\$65	\$333,071	\$346,536	\$680,007	\$333,071	\$160,616	\$493,687
4	\$33	\$34	\$67	\$445,899	\$464,460	\$910,360	\$445,899	\$210,809	\$666,708
5	\$33	\$35	\$68	\$454,817	\$473,749	\$928,567	\$454,817	\$210,809	\$665,620
6	\$34	\$35	\$69	\$463,914	\$483,224	\$947,138	\$463,914	\$210,809	\$674,722
7	\$35	\$36	\$71	\$473,192	\$492,889	\$966,081	\$473,192	\$210,809	\$684,001
8	\$35	\$37	\$72	\$482,666	\$502,747	\$985,412	\$482,666	\$210,809	\$693,464
9	\$36	\$38	\$74	\$492,309	\$512,802	\$1,005,111	\$492,309	\$210,809	\$703,117
10	\$37	\$38	\$75	\$502,155	\$523,058	\$1,025,213	\$502,155	\$210,809	\$712,964
11	\$38	\$39	\$77	\$512,198	\$533,919	\$1,045,717	\$512,198	\$210,809	\$723,007
12	\$38	\$40	\$78	\$522,442	\$544,189	\$1,066,631	\$522,442	\$210,809	\$733,251
13	\$39	\$41	\$80	\$532,891	\$555,073	\$1,087,964	\$532,891	\$210,809	\$743,700
14	\$40	\$41	\$81	\$543,549	\$566,174	\$1,109,723	\$543,549	\$210,809	\$754,357
15	\$41	\$42	\$83	\$554,420	\$577,498	\$1,131,918	\$554,420	\$210,809	\$765,228
16	\$41	\$43	\$85	\$565,508	\$588,948	\$1,154,556	\$565,508	\$210,809	\$776,317
17	\$42	\$44	\$86	\$576,818	\$600,829	\$1,177,647	\$576,818	\$210,809	\$787,627
18	\$43	\$45	\$88	\$588,355	\$612,945	\$1,201,200	\$588,355	\$210,809	\$799,163
19	\$44	\$46	\$90	\$600,122	\$625,192	\$1,225,224	\$600,122	\$210,809	\$810,930
20	\$45	\$47	\$92	\$612,124	\$637,604	\$1,249,729	\$612,124	\$210,809	\$822,933
21	\$46	\$48	\$93	\$645,076	\$649,540	\$910,517	\$645,076	\$150,578	\$596,554
22	\$47	\$49	\$95	\$303,264	\$315,887	\$619,151	\$303,264	\$100,385	\$403,649
23	\$48	\$50	\$97	\$154,665	\$161,103	\$315,767	\$154,665	\$50,193	\$204,857
Totals	\$688	\$925	\$1,813	\$10,504,893	\$10,942,169	\$21,447,061	\$10,504,893	\$4,216,173	\$14,721,065

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equivalent	\$/CCF-Saved
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TCB	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$90,899	\$0	\$0	\$0	\$90,899	\$0	\$66,827	\$66,827		
2	\$171,980	\$0	\$0	\$0	\$171,980	\$0	\$127,172	\$127,172		
3	\$258,158	\$0	\$0	\$0	\$258,158	\$0	\$192,007	\$192,007		
4	\$349,675	\$0	\$0	\$0	\$349,675	\$0	\$261,586	\$261,586		
5	\$360,865	\$0	\$0	\$0	\$360,865	\$0	\$271,526	\$271,526		
6	\$372,412	\$0	\$0	\$0	\$372,412	\$0	\$281,844	\$281,844		
7	\$384,330	\$0	\$0	\$0	\$384,330	\$0	\$292,554	\$292,554		
8	\$396,628	\$0	\$0	\$0	\$396,628	\$0	\$303,671	\$303,671		
9	\$409,320	\$0	\$0	\$0	\$409,320	\$0	\$315,210	\$315,210		
10	\$422,418	\$0	\$0	\$0	\$422,418	\$0	\$327,188	\$327,188		
11	\$435,936	\$0	\$0	\$0	\$435,936	\$0	\$339,622	\$339,622		
12	\$449,886	\$0	\$0	\$0	\$449,886	\$0	\$352,527	\$352,527		
13	\$464,282	\$0	\$0	\$0	\$464,282	\$0	\$365,923	\$365,923		
14	\$479,139	\$0	\$0	\$0	\$479,139	\$0	\$379,828	\$379,828		
15	\$494,472	\$0	\$0	\$0	\$494,472	\$0	\$394,262	\$394,262		
16	\$510,295	\$0	\$0	\$0	\$510,295	\$0	\$409,244	\$409,244		
17	\$526,624	\$0	\$0	\$0	\$526,624	\$0	\$424,795	\$424,795		
18	\$543,476	\$0	\$0	\$0	\$543,476	\$0	\$440,937	\$440,937		
19	\$560,867	\$0	\$0	\$0	\$560,867	\$0	\$457,693	\$457,693		
20	\$578,815	\$0	\$0	\$0	\$578,815	\$0	\$475,085	\$475,085		
21	\$426,669	\$0	\$0	\$0	\$426,669	\$0	\$352,242	\$352,242		
22	\$293,549	\$0	\$0	\$0	\$293,549	\$0	\$243,751	\$243,751		
23	\$151,471	\$0	\$0	\$0	\$151,471	\$0	\$126,507	\$126,507		
Totals	\$9,132,166	\$0	\$0	\$0	\$9,132,166	\$0	\$7,202,000			

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TCB	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$90,899	\$0	\$0	\$0	\$90,899	\$0	\$66,827	\$66,827		
2	\$171,980	\$0	\$0	\$0	\$171,980	\$0	\$127,172	\$127,172		
3	\$258,158	\$0	\$0	\$0	\$258,158	\$0	\$192,007	\$192,007		
4	\$349,675	\$0	\$0	\$0	\$349,675	\$0	\$261,586	\$261,586		
5	\$360,865	\$0	\$0	\$0	\$360,865	\$0	\$271,526	\$271,526		
6	\$372,412	\$0	\$0	\$0	\$372,412	\$0	\$281,844	\$281,844		
7	\$384,330	\$0	\$0	\$0	\$384,330	\$0	\$292,554	\$292,554		
8	\$396,628	\$0	\$0	\$0	\$396,628	\$0	\$303,671	\$303,671		
9	\$409,320	\$0	\$0	\$0	\$409,320	\$0	\$315,210	\$315,210		
10	\$422,418	\$0	\$0	\$0	\$422,418	\$0	\$327,188	\$327,188		
11	\$435,936	\$0	\$0	\$0	\$435,936	\$0	\$339,622	\$339,622		
12	\$449,886	\$0	\$0	\$0	\$449,886	\$0	\$352,527	\$352,527		
13	\$464,282	\$0	\$0	\$0	\$464,282	\$0	\$365,923	\$365,923		
14	\$479,139	\$0	\$0	\$0	\$479,139	\$0	\$379,828	\$379,828		
15	\$494,472	\$0	\$0	\$0	\$494,472	\$0	\$394,262	\$394,262		
16	\$510,295	\$0	\$0	\$0	\$510,295	\$0	\$409,244	\$409,244		
17	\$526,624	\$0	\$0	\$0	\$526,624	\$0	\$424,795	\$424,795		
18	\$543,476	\$0	\$0	\$0	\$543,476	\$0	\$440,937	\$440,937		
19	\$560,867	\$0	\$0	\$0	\$560,867	\$0	\$457,693	\$457,693		
20	\$578,815	\$0	\$0	\$0	\$578,815	\$0	\$475,085	\$475,085		
21	\$426,669	\$0	\$0	\$0	\$426,669	\$0	\$352,242	\$352,242		
22	\$293,549	\$0	\$0	\$0	\$293,549	\$0	\$243,751	\$243,751		
23	\$151,471	\$0	\$0	\$0	\$151,471	\$0	\$126,507	\$126,507		
Totals	\$9,132,166	\$0	\$0	\$0	\$9,132,166	\$0	\$7,202,000	\$7,202,000		

Participation and Total Participant Costs									
Year	Participation				Total Participant Costs				
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Adds)	Cumulative Participants (Net Dropouts)	One-Time Investment	Annual Investment	Total Costs
1	25000	0	25000	0	25000	0	\$0	\$0	\$0
2	25000	0	25000	0	25000	25000	\$0	\$0	\$0
3	25000	0	25000	0	25000	25000	\$0	\$0	\$0
4	25000	0	25000	0	25000	25000	\$0	\$0	\$0
Totals	100000	0	100000	0	100000	100000	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings																Gas Impacts/Savings													
	Per Participant				Cumulative												Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative				Yearly Incremental	
	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	COF	COF (net)	COF	COF (net)	COF	COF (net)
1	0.08	0.08	0.08	0.08	0.04	0.04	263	263	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	0	0	0	0	0	0
2	0.08	0.08	0.08	0.08	0.04	0.04	263	263	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	0	0	0	0	0	0
3	0.08	0.08	0.08	0.08	0.04	0.04	263	263	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	0	0	0	0	0	0
4	0.08	0.08	0.08	0.08	0.04	0.04	263	263	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	2,075	2,075	1,965	1,965	943	943	6,583,941	6,583,941	0	0	0	0	0	0
Totals							1,053	1,053							26,335,764	26,335,764							26,335,764	26,335,764	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Total	Net Fuel Electric	Net Fuel Gas	Total
1	\$20	\$0	\$20	\$493,209	\$0	\$493,209	\$493,209	\$0	\$493,209
2	\$20	\$0	\$20	\$503,073	\$0	\$503,073	\$503,073	\$0	\$503,073
3	\$21	\$0	\$21	\$513,136	\$0	\$513,136	\$513,136	\$0	\$513,136
4	\$21	\$0	\$21	\$523,397	\$0	\$523,397	\$523,397	\$0	\$523,397
Totals	\$81	\$0	\$81	\$2,032,815	\$0	\$2,032,815	\$2,032,815	\$0	\$2,032,815

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Hardware	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh/CCF	\$/kWh/CCF
1	\$10,209	\$210,996	\$0	\$0	\$221,204	\$76	\$76	\$0	\$0	\$0
2	\$8,071	\$214,753	\$0	\$0	\$222,824	\$77	\$77	\$0	\$0	\$0
3	\$10,706	\$218,660	\$0	\$0	\$229,366	\$79	\$79	\$0	\$0	\$0
4	\$9,017	\$222,596	\$0	\$0	\$231,612	\$80	\$80	\$0	\$0	\$0
Totals	\$38,503	\$867,044	\$0	\$0	\$905,547	\$311	\$311	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$362,308	\$196,333	\$0	\$0	\$558,642	\$0	\$0	\$0		
2	\$373,902	\$202,616	\$0	\$0	\$576,518	\$0	\$0	\$0		
3	\$385,867	\$209,100	\$0	\$0	\$594,967	\$0	\$0	\$0		
4	\$398,215	\$215,791	\$0	\$0	\$614,006	\$0	\$0	\$0		
Totals	\$1,520,292	\$823,840	\$0	\$0	\$2,344,132	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$362,308	\$196,333	\$0	\$0	\$558,642	\$0	\$0	\$0		
2	\$373,902	\$202,616	\$0	\$0	\$576,518	\$0	\$0	\$0		
3	\$385,867	\$209,100	\$0	\$0	\$594,967	\$0	\$0	\$0		
4	\$398,215	\$215,791	\$0	\$0	\$614,006	\$0	\$0	\$0		
Totals	\$1,520,292	\$823,840	\$0	\$0	\$2,344,132	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (for riders)	Cumulative Participants (for nonriders)	One-Time Investment	Annual Recurrence	Total Costs
1	145000	0	145000	0	145000	145000	\$0	\$0	\$0
2	145000	0	145000	0	145000	145000	\$0	\$0	\$0
3	145000	0	145000	0	145000	145000	\$0	\$0	\$0
4	145000	0	145000	0	145000	145000	\$0	\$0	\$0
Total	580000	0	580000	0	580000	580000	\$0	\$0	\$0

Impacts and Savings																							
Year	Electric Impacts/Savings												Gas Impacts/Savings										
	Per Participant												Per Participant										
	kW	kWh (net)	Summer Cdn kW	Summer Cdn kWh	Winter Cdn kW	Winter Cdn kWh	With	With (net)	kWh	kWh (net)	Summer Cdn kWh	Summer Cdn kWh (net)	Winter Cdn kWh	Winter Cdn kWh (net)	With	With (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)	
1	0.08	0.08	0.08	0.08	0.04	0.04	263	263	12,033	12,033	11,396	11,396	5,467	5,467	38,186,858	38,186,858	13	13	1,821,960	1,821,960	1,821,960	1,821,960	
2	0.08	0.08	0.08	0.08	0.04	0.04	263	263	12,033	12,033	11,396	11,396	5,467	5,467	38,186,858	38,186,858	13	13	1,821,960	1,821,960	1,821,960	1,821,960	
3	0.08	0.08	0.08	0.08	0.04	0.04	263	263	12,033	12,033	11,396	11,396	5,467	5,467	38,186,858	38,186,858	13	13	1,821,960	1,821,960	1,821,960	1,821,960	
4	0.08	0.08	0.08	0.08	0.04	0.04	263	263	12,033	12,033	11,396	11,396	5,467	5,467	38,186,858	38,186,858	13	13	1,821,960	1,821,960	1,821,960	1,821,960	
Total							1,053	1,053							152,747,430	152,747,430	50	50	7,287,841	7,287,841	7,287,841	7,287,841	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net FreeParticipant Electric	Net FreeParticipant Gas	Net FreeParticipant Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$20	\$16	\$36	\$2,860,613	\$2,315,028	\$5,175,641	\$2,860,613	\$1,126,258	\$3,986,871
2	\$20	\$16	\$36	\$2,917,825	\$2,361,529	\$5,279,354	\$2,917,825	\$1,126,258	\$4,044,083
3	\$21	\$17	\$38	\$2,976,182	\$2,408,555	\$5,384,737	\$2,976,182	\$1,126,258	\$4,102,439
4	\$21	\$17	\$38	\$3,035,705	\$2,456,726	\$5,492,432	\$3,035,705	\$1,126,258	\$4,161,963
Total	\$81	\$66	\$147	\$11,790,325	\$9,541,838	\$21,332,163	\$11,790,325	\$4,505,031	\$16,295,356

Utility Program Costs											
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Enroll	Other	Total	\$/kW	\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr	
1	\$56,374	\$1,223,774	\$0	\$0	\$1,280,148	\$76	\$76	\$0	\$0	\$1	\$1
2	\$47,333	\$1,245,802	\$0	\$0	\$1,293,135	\$77	\$77	\$0	\$0	\$1	\$1
3	\$59,122	\$1,268,227	\$0	\$0	\$1,327,349	\$79	\$79	\$0	\$0	\$1	\$1
4	\$49,793	\$1,291,055	\$0	\$0	\$1,340,847	\$80	\$80	\$0	\$0	\$1	\$1
Total	\$212,621	\$5,028,858	\$0	\$0	\$5,241,479	\$311	\$311	\$0	\$0	\$3	\$3

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Enrgy	Address Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$2,101,388	\$1,138,733	\$0	\$0	\$3,240,121	\$0	\$1,225,622	\$1,225,622		
2	\$2,168,632	\$1,175,173	\$0	\$0	\$3,343,805	\$0	\$1,272,196	\$1,272,196		
3	\$2,238,028	\$1,212,778	\$0	\$0	\$3,450,807	\$0	\$1,320,539	\$1,320,539		
4	\$2,309,645	\$1,251,587	\$0	\$0	\$3,561,233	\$0	\$1,370,720	\$1,370,720		
Total	\$8,817,694	\$4,778,272	\$0	\$0	\$13,595,965	\$0	\$5,189,077	\$5,189,077		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Enrgy	Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$2,101,388	\$1,138,733	\$0	\$0	\$3,240,121	\$0	\$1,225,622	\$1,225,622		
2	\$2,168,632	\$1,175,173	\$0	\$0	\$3,343,805	\$0	\$1,272,196	\$1,272,196		
3	\$2,238,028	\$1,212,778	\$0	\$0	\$3,450,807	\$0	\$1,320,539	\$1,320,539		
4	\$2,309,645	\$1,251,587	\$0	\$0	\$3,561,233	\$0	\$1,370,720	\$1,370,720		
Total	\$8,817,694	\$4,778,272	\$0	\$0	\$13,595,965	\$0	\$5,189,077	\$5,189,077		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (for new riders)	Cumulative Participants (for non-participants)	One-Time Investment	Annual Investment	Total Costs
1	205000	0	205000	0	205000	205000	\$0	\$0	\$0
2	205000	0	205000	0	205000	205000	\$0	\$0	\$0
3	205000	0	205000	0	205000	205000	\$0	\$0	\$0
4	205000	0	205000	0	205000	205000	\$0	\$0	\$0
Total	820000	0	820000	0	820000	820000	\$0	\$0	\$0

Impacts and Savings																														
Year	Per Participant										Electric Impacts/Savings										Per Participant		Gas Impacts/Savings							
	kW	kWh (est)	Summer Cdn kW	Summer Cdn kWh (est)	Winter Cdn kW	Winter Cdn kWh (est)	With	With (est)	With (est)	With (est)	Summer Cdn kWh (est)	Winter Cdn kWh (est)	With	With (est)	With (est)	With (est)	Summer Cdn kWh (est)	Winter Cdn kWh (est)	With	With (est)	With (est)	With (est)	CCF	CCF (est)	CCF	CCF (est)	CCF	CCF (est)		
1	0.10	0.10	0.08	0.08	0.09	0.09	329	329	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	0	0	0	0	0	0
2	0.10	0.10	0.08	0.08	0.09	0.09	329	329	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	0	0	0	0	0	0
3	0.10	0.10	0.08	0.08	0.09	0.09	329	329	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	0	0	0	0	0	0
4	0.10	0.10	0.08	0.08	0.09	0.09	329	329	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	20,831	20,831	15,497	15,497	18,377	18,377	67,482,780	67,482,780	0	0	0	0	0	0
Total							1,317	1,317							269,931,121	269,931,121							0	0	0	0	0	0		

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Parasit Electric	Net Free/Parasit Gas	Net Free/Parasit Total	Net Fuel Electric	Net Fuel Gas	Net Fuel Total
1	\$23	\$0	\$23	\$4,765,537	\$0	\$4,765,537	\$4,765,537	\$0	\$4,765,537
2	\$24	\$0	\$24	\$4,860,847	\$0	\$4,860,847	\$4,860,847	\$0	\$4,860,847
3	\$24	\$0	\$24	\$4,956,064	\$0	\$4,956,064	\$4,956,064	\$0	\$4,956,064
4	\$25	\$0	\$25	\$5,057,226	\$0	\$5,057,226	\$5,057,226	\$0	\$5,057,226
Total	\$96	\$0	\$96	\$19,641,674	\$0	\$19,641,674	\$19,641,674	\$0	\$19,641,674

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Enroll	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF from	\$/CCF from
1	\$79,052	\$1,730,164	\$0	\$0	\$1,809,215	\$53	\$53	\$0	\$0	\$0
2	\$66,374	\$1,751,307	\$0	\$0	\$1,817,680	\$54	\$54	\$0	\$0	\$0
3	\$82,905	\$1,793,010	\$0	\$0	\$1,875,915	\$55	\$55	\$0	\$0	\$0
4	\$69,823	\$1,825,284	\$0	\$0	\$1,895,107	\$56	\$56	\$0	\$0	\$0
Total	\$298,154	\$7,109,765	\$0	\$0	\$7,407,918	\$219	\$219	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$3,358,598	\$1,548,474	\$0	\$0	\$4,907,072	\$0	\$0	\$0	\$0	\$0
2	\$3,466,073	\$1,598,025	\$0	\$0	\$5,064,098	\$0	\$0	\$0	\$0	\$0
3	\$3,576,988	\$1,649,162	\$0	\$0	\$5,226,150	\$0	\$0	\$0	\$0	\$0
4	\$3,691,451	\$1,701,935	\$0	\$0	\$5,393,386	\$0	\$0	\$0	\$0	\$0
Total	\$14,093,110	\$6,497,596	\$0	\$0	\$20,590,706	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Arbitrary	Total	Gas Distribution	Gas Fuel	Total		
1	\$3,358,598	\$1,548,474	\$0	\$0	\$4,907,072	\$0	\$0	\$0	\$0	\$0
2	\$3,466,073	\$1,598,025	\$0	\$0	\$5,064,098	\$0	\$0	\$0	\$0	\$0
3	\$3,576,988	\$1,649,162	\$0	\$0	\$5,226,150	\$0	\$0	\$0	\$0	\$0
4	\$3,691,451	\$1,701,935	\$0	\$0	\$5,393,386	\$0	\$0	\$0	\$0	\$0
Total	\$14,093,110	\$6,497,596	\$0	\$0	\$20,590,706	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs		Participation				Total Participant Costs			
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net New Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual	Total Costs
1	1350	0	1350	0	1350	1350	\$0	\$0	\$0
2	1600	0	2950	0	2950	2950	\$0	\$0	\$0
3	1850	0	4800	0	4800	4800	\$0	\$0	\$0
4	2100	0	6900	0	6900	6900	\$0	\$0	\$0
5	0	0	6900	0	6900	6900	\$0	\$0	\$0
6	0	0	6900	0	6900	6900	\$0	\$0	\$0
7	0	0	6900	0	6900	6900	\$0	\$0	\$0
8	0	0	6900	0	6900	6900	\$0	\$0	\$0
9	0	0	6900	0	6900	6900	\$0	\$0	\$0
10	0	0	6900	0	6900	6900	\$0	\$0	\$0
11	0	0	6900	0	6900	6900	\$0	\$0	\$0
12	0	0	6900	0	6900	6900	\$0	\$0	\$0
13	0	0	6900	0	6900	6900	\$0	\$0	\$0
14	0	0	6900	0	6900	6900	\$0	\$0	\$0
15	0	0	6900	0	6900	6900	\$0	\$0	\$0
16	0	0	6900	0	6900	6900	\$0	\$0	\$0
17	0	0	6900	0	6900	6900	\$0	\$0	\$0
18	0	0	6900	0	6900	6900	\$0	\$0	\$0
19	0	0	6900	0	6900	6900	\$0	\$0	\$0
20	0	0	6900	0	6900	6900	\$0	\$0	\$0
21	0	0	6900	0	6900	6900	\$0	\$0	\$0
22	0	0	3950	0	3950	3950	\$0	\$0	\$0
23	0	0	2100	0	2100	2100	\$0	\$0	\$0
Total	6900	0	138000	0	138000	138000	\$0	\$0	\$0

Impacts and Savings		Electric Impacts/Savings														Gas Impacts/Savings					
Year	Per Participant														Per Participant						
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh (net)	Winter Coin kW	Winter Coin kWh (net)	kWh	kWh	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	kWh	kWh (net)	
1	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
2	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
3	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
4	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
5	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
6	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
7	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
8	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
9	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
10	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
11	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
12	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
13	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
14	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
15	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
16	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
17	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
18	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
19	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
20	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
21	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
22	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
23	0.2	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	
Total																					

Lost Revenue Dollars		Cumulative Lost Revenue															
Year	Lost Revenue per Participant			Cumulative Lost Revenue							Cumulative Lost Revenue (Net Fuel)						
	Electric	Gas	Total	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant	Net Fuel/Participant
1	\$162	\$454	\$616	\$218,156	\$613,024	\$831,180	\$218,156	\$629,269	\$847,425	\$218,156	\$613,024	\$831,180	\$218,156	\$613,024	\$831,180	\$218,156	\$613,024
2	\$165	\$463	\$628	\$486,245	\$1,369,362	\$1,855,607	\$486,245	\$1,455,512	\$1,941,757	\$486,245	\$1,369,362	\$1,855,607	\$486,245	\$1,369,362	\$1,855,607	\$486,245	\$1,369,362
3	\$168	\$472	\$641	\$807,002	\$2,287,688	\$3,094,700	\$807,002	\$2,404,845	\$3,211,847	\$807,002	\$2,287,688	\$3,094,700	\$807,002	\$2,287,688	\$3,094,700	\$807,002	\$2,287,688
4	\$171	\$482	\$653	\$1,183,267	\$3,325,012	\$4,508,278	\$1,183,267	\$3,511,129	\$4,694,399	\$1,183,267	\$3,325,012	\$4,508,278	\$1,183,267	\$3,325,012	\$4,508,278	\$1,183,267	\$3,325,012
5	\$175	\$492	\$666	\$1,208,532	\$3,591,512	\$4,598,444	\$1,208,532	\$3,809,594	\$5,008,038	\$1,208,532	\$3,591,512	\$4,598,444	\$1,208,532	\$3,591,512	\$4,598,444	\$1,208,532	\$3,591,512
6	\$178	\$501	\$680	\$1,231,071	\$3,459,342	\$4,690,413	\$1,231,071	\$3,680,413	\$5,100,223	\$1,231,071	\$3,459,342	\$4,690,413	\$1,231,071	\$3,459,342	\$4,690,413	\$1,231,071	\$3,459,342
7	\$182	\$511	\$693	\$1,255,692	\$3,528,529	\$4,784,221	\$1,255,692	\$3,804,221	\$5,192,413	\$1,255,692	\$3,528,529	\$4,784,221	\$1,255,692	\$3,528,529	\$4,784,221	\$1,255,692	\$3,528,529
8	\$186	\$522	\$707	\$1,280,806	\$3,599,069	\$4,879,305	\$1,280,806	\$3,904,069	\$5,284,607	\$1,280,806	\$3,599,069	\$4,879,305	\$1,280,806	\$3,599,069	\$4,879,305	\$1,280,806	\$3,599,069
9	\$189	\$532	\$721	\$1,306,422	\$3,671,081	\$4,977,503	\$1,306,422	\$4,009,503	\$5,379,091	\$1,306,422	\$3,671,081	\$4,977,503	\$1,306,422	\$3,671,081	\$4,977,503	\$1,306,422	\$3,671,081
10	\$193	\$543	\$736	\$1,332,550	\$3,744,503	\$5,077,054	\$1,332,550	\$4,107,054	\$5,474,575	\$1,332,550	\$3,744,503	\$5,077,054	\$1,332,550	\$3,744,503	\$5,077,054	\$1,332,550	\$3,744,503
11	\$197	\$554	\$751	\$1,359,201	\$3,819,393	\$5,178,595	\$1,359,201	\$4,209,595	\$5,574,066	\$1,359,201	\$3,819,393	\$5,178,595	\$1,359,201	\$3,819,393	\$5,178,595	\$1,359,201	\$3,819,393
12	\$201	\$565	\$766	\$1,386,385	\$3,896,781	\$5,282,166	\$1,386,385	\$4,311,166	\$5,676,557	\$1,386,385	\$3,896,781	\$5,282,166	\$1,386,385	\$3,896,781	\$5,282,166	\$1,386,385	\$3,896,781
13	\$205	\$576	\$781	\$1,414,113	\$3,973,697	\$5,387,810	\$1,414,113	\$4,418,697	\$5,781,048	\$1,414,113	\$3,973,697	\$5,387,810	\$1,414,113	\$3,973,697	\$5,387,810	\$1,414,113	\$3,973,697
14	\$209	\$587	\$796	\$1,442,395	\$4,053,171	\$5,495,566	\$1,442,395	\$4,526,566	\$5,886,539	\$1,442,395	\$4,053,171	\$5,495,566	\$1,442,395	\$4,053,171	\$5,495,566	\$1,442,395	\$4,053,171
15	\$213	\$599	\$812	\$1,471,243	\$4,134,234	\$5,605,477	\$1,471,243	\$4,637,477	\$6,000,391	\$1,471,243	\$4,134,234	\$5,605,477	\$1,471,243	\$4,134,234	\$5,605,477	\$1,471,243	\$4,134,234
16	\$217	\$611	\$829	\$1,500,668	\$4,216,919	\$5,717,587	\$1,500,668	\$4,750,587	\$6,113,501	\$1,500,668	\$4,216,919	\$5,717,587	\$1,500,668	\$4,216,919	\$5,717,587	\$1,500,668	\$4,216,919
17	\$222	\$623	\$845	\$1,530,682	\$4,301,257	\$5,831,939	\$1,530,682	\$4,865,939	\$6,228,020	\$1,530,682	\$4,301,257	\$5,831,939	\$1,530,682	\$4,301,257	\$5,831,939	\$1,530,682	\$4,301,257
18	\$226	\$636	\$862	\$1,561,295	\$4,387,282	\$5,948,577	\$1,561,295	\$4,982,577	\$6,343,443	\$1,561,295	\$4,387,282	\$5,948,577	\$1,561,295	\$4,387,282	\$5,948,577	\$1,561,295	\$4,387,282
19	\$231	\$649	\$879	\$1,592,521	\$4,476,028	\$6,067,549	\$1,592,521	\$5,107,549	\$6,461,866	\$1,592,521	\$4,476,028	\$6,067,549	\$1,592,521	\$4,476,028	\$6,067,549	\$1,592,521	\$4,476,028
20	\$235	\$662	\$897	\$1,624,372	\$4,564,528	\$6,189,900	\$1,624,372	\$5,232,900	\$6,583,289	\$1,624,372	\$4,564,528	\$6,189,900	\$1,624,372	\$4,564,528	\$6,189,900	\$1,624,372	\$4,564,528
21	\$240	\$675	\$915	\$1,657,691	\$4,654,888	\$6,317,589	\$1,657,691	\$5,364,589	\$6,708,703	\$1,657,691	\$4,654,888	\$6,317,589	\$1,657,691	\$4,654,888	\$6,317,589	\$1,657,691	

Utility Program Costs											
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Operations	Other	Total	kWh	kWh	kWh	CCF	CCF	
1	\$137,509	\$2,267,519	\$0	\$68,361	\$2,473,389	\$9,062	\$9,062	\$1	\$1	\$5	\$5
2	\$133,107	\$2,740,865	\$0	\$69,951	\$2,943,923	\$4,930	\$4,930	\$0	\$0	\$3	\$3
3	\$142,616	\$3,217,476	\$0	\$70,844	\$3,430,936	\$3,531	\$3,531	\$0	\$0	\$2	\$2
4	\$152,239	\$3,697,132	\$0	\$72,119	\$3,921,490	\$2,808	\$2,808	\$0	\$0	\$2	\$2
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$565,470	\$11,923,092	\$0	\$380,916	\$12,769,478	\$20,321	\$20,321	\$2	\$2	\$12	\$12

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TD	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$175,784	\$27,304	\$0	\$0	\$203,088	\$0	\$327,605	\$327,605	\$0	\$327,605
2	\$396,412	\$61,573	\$0	\$0	\$457,985	\$0	\$743,082	\$743,082	\$0	\$743,082
3	\$665,650	\$103,382	\$0	\$0	\$769,033	\$0	\$1,255,027	\$1,255,027	\$0	\$1,255,027
4	\$987,492	\$153,382	\$0	\$0	\$1,140,875	\$0	\$1,872,657	\$1,872,657	\$0	\$1,872,657
5	\$1,019,092	\$158,291	\$0	\$0	\$1,177,383	\$0	\$1,943,818	\$1,943,818	\$0	\$1,943,818
6	\$1,051,703	\$163,356	\$0	\$0	\$1,215,059	\$0	\$2,017,683	\$2,017,683	\$0	\$2,017,683
7	\$1,085,358	\$168,583	\$0	\$0	\$1,253,941	\$0	\$2,094,355	\$2,094,355	\$0	\$2,094,355
8	\$1,120,089	\$173,978	\$0	\$0	\$1,294,067	\$0	\$2,173,941	\$2,173,941	\$0	\$2,173,941
9	\$1,155,932	\$179,545	\$0	\$0	\$1,335,477	\$0	\$2,256,551	\$2,256,551	\$0	\$2,256,551
10	\$1,192,922	\$185,291	\$0	\$0	\$1,378,212	\$0	\$2,342,300	\$2,342,300	\$0	\$2,342,300
11	\$1,231,095	\$191,220	\$0	\$0	\$1,422,315	\$0	\$2,431,307	\$2,431,307	\$0	\$2,431,307
12	\$1,270,490	\$197,339	\$0	\$0	\$1,467,829	\$0	\$2,523,697	\$2,523,697	\$0	\$2,523,697
13	\$1,311,146	\$203,654	\$0	\$0	\$1,514,800	\$0	\$2,619,597	\$2,619,597	\$0	\$2,619,597
14	\$1,353,103	\$210,171	\$0	\$0	\$1,563,273	\$0	\$2,719,142	\$2,719,142	\$0	\$2,719,142
15	\$1,396,402	\$216,896	\$0	\$0	\$1,613,298	\$0	\$2,822,469	\$2,822,469	\$0	\$2,822,469
16	\$1,441,087	\$223,837	\$0	\$0	\$1,664,924	\$0	\$2,929,723	\$2,929,723	\$0	\$2,929,723
17	\$1,487,201	\$231,000	\$0	\$0	\$1,718,201	\$0	\$3,041,052	\$3,041,052	\$0	\$3,041,052
18	\$1,534,792	\$238,392	\$0	\$0	\$1,773,184	\$0	\$3,156,612	\$3,156,612	\$0	\$3,156,612
19	\$1,583,905	\$246,020	\$0	\$0	\$1,829,926	\$0	\$3,276,564	\$3,276,564	\$0	\$3,276,564
20	\$1,634,590	\$253,893	\$0	\$0	\$1,888,483	\$0	\$3,401,073	\$3,401,073	\$0	\$3,401,073
21	\$1,686,852	\$262,793	\$0	\$0	\$1,949,645	\$0	\$2,839,600	\$2,839,600	\$0	\$2,839,600
22	\$996,589	\$154,795	\$0	\$0	\$1,151,385	\$0	\$2,097,774	\$2,097,774	\$0	\$2,097,774
23	\$546,787	\$84,930	\$0	\$0	\$631,717	\$0	\$1,157,653	\$1,157,653	\$0	\$1,157,653
Total	\$25,994,474	\$4,037,595	\$0	\$0	\$30,032,068	\$0	\$52,043,282	\$52,043,282	\$0	\$52,043,282

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	TD	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$175,784	\$27,304	\$0	\$0	\$203,088	\$0	\$327,605	\$327,605	\$0	\$327,605
2	\$396,412	\$61,573	\$0	\$0	\$457,985	\$0	\$743,082	\$743,082	\$0	\$743,082
3	\$665,650	\$103,382	\$0	\$0	\$769,033	\$0	\$1,255,027	\$1,255,027	\$0	\$1,255,027
4	\$987,492	\$153,382	\$0	\$0	\$1,140,875	\$0	\$1,872,657	\$1,872,657	\$0	\$1,872,657
5	\$1,019,092	\$158,291	\$0	\$0	\$1,177,383	\$0	\$1,943,818	\$1,943,818	\$0	\$1,943,818
6	\$1,051,703	\$163,356	\$0	\$0	\$1,215,059	\$0	\$2,017,683	\$2,017,683	\$0	\$2,017,683
7	\$1,085,358	\$168,583	\$0	\$0	\$1,253,941	\$0	\$2,094,355	\$2,094,355	\$0	\$2,094,355
8	\$1,120,089	\$173,978	\$0	\$0	\$1,294,067	\$0	\$2,173,941	\$2,173,941	\$0	\$2,173,941
9	\$1,155,932	\$179,545	\$0	\$0	\$1,335,477	\$0	\$2,256,551	\$2,256,551	\$0	\$2,256,551
10	\$1,192,922	\$185,291	\$0	\$0	\$1,378,212	\$0	\$2,342,300	\$2,342,300	\$0	\$2,342,300
11	\$1,231,095	\$191,220	\$0	\$0	\$1,422,315	\$0	\$2,431,307	\$2,431,307	\$0	\$2,431,307
12	\$1,270,490	\$197,339	\$0	\$0	\$1,467,829	\$0	\$2,523,697	\$2,523,697	\$0	\$2,523,697
13	\$1,311,146	\$203,654	\$0	\$0	\$1,514,800	\$0	\$2,619,597	\$2,619,597	\$0	\$2,619,597
14	\$1,353,103	\$210,171	\$0	\$0	\$1,563,273	\$0	\$2,719,142	\$2,719,142	\$0	\$2,719,142
15	\$1,396,402	\$216,896	\$0	\$0	\$1,613,298	\$0	\$2,822,469	\$2,822,469	\$0	\$2,822,469
16	\$1,441,087	\$223,837	\$0	\$0	\$1,664,924	\$0	\$2,929,723	\$2,929,723	\$0	\$2,929,723
17	\$1,487,201	\$231,000	\$0	\$0	\$1,718,201	\$0	\$3,041,052	\$3,041,052	\$0	\$3,041,052
18	\$1,534,792	\$238,392	\$0	\$0	\$1,773,184	\$0	\$3,156,612	\$3,156,612	\$0	\$3,156,612
19	\$1,583,905	\$246,020	\$0	\$0	\$1,829,926	\$0	\$3,276,564	\$3,276,564	\$0	\$3,276,564
20	\$1,634,590	\$253,893	\$0	\$0	\$1,888,483	\$0	\$3,401,073	\$3,401,073	\$0	\$3,401,073
21	\$1,686,852	\$262,793	\$0	\$0	\$1,949,645	\$0	\$2,839,600	\$2,839,600	\$0	\$2,839,600
22	\$996,589	\$154,795	\$0	\$0	\$1,151,385	\$0	\$2,097,774	\$2,097,774	\$0	\$2,097,774
23	\$546,787	\$84,930	\$0	\$0	\$631,717	\$0	\$1,157,653	\$1,157,653	\$0	\$1,157,653
Total	\$25,994,474	\$4,037,595	\$0	\$0	\$30,032,068	\$0	\$52,043,282	\$52,043,282	\$0	\$52,043,282

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/Free Riders)	Cumulative Participants (w/No-Participants)	One-Time Investment	Annual	Total
1	1350	0	1350	0	1350	1350	\$0	\$0	\$0
2	1800	0	2950	0	2950	2950	\$0	\$0	\$0
3	1850	0	4800	0	4800	4800	\$0	\$0	\$0
4	2100	0	6900	0	6900	6900	\$0	\$0	\$0
5	0	0	6900	0	6900	6900	\$0	\$0	\$0
6	0	0	6900	0	6900	6900	\$0	\$0	\$0
7	0	0	6900	0	6900	6900	\$0	\$0	\$0
8	0	0	6900	0	6900	6900	\$0	\$0	\$0
9	0	0	6900	0	6900	6900	\$0	\$0	\$0
10	0	0	6900	0	6900	6900	\$0	\$0	\$0
11	0	0	6900	0	6900	6900	\$0	\$0	\$0
12	0	0	6900	0	6900	6900	\$0	\$0	\$0
13	0	0	6900	0	6900	6900	\$0	\$0	\$0
14	0	0	6900	0	6900	6900	\$0	\$0	\$0
15	0	0	6900	0	6900	6900	\$0	\$0	\$0
16	0	0	6900	0	6900	6900	\$0	\$0	\$0
17	0	0	6900	0	6900	6900	\$0	\$0	\$0
18	0	0	6900	0	6900	6900	\$0	\$0	\$0
19	0	0	6900	0	6900	6900	\$0	\$0	\$0
20	0	0	6900	0	6900	6900	\$0	\$0	\$0
21	0	0	5550	0	5550	5550	\$0	\$0	\$0
22	0	0	3950	0	3950	3950	\$0	\$0	\$0
23	0	0	2100	0	2100	2100	\$0	\$0	\$0
Total	8900	0	138000	0	138000	138000	\$0	\$0	\$0

Impacts and Savings																								
Year	Electric Impacts/Savings										Gas Impacts/Savings													
	Per Participant					Cumulative					Yearly Incremental (Per Participant * Incremental Participants)						Per Participant							
	kW	kWh (net)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2 (lb)	CO2 (net)	CO2 (lb)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)					
1	0.2	2,493	0	2,493	0	2,493	319	319	0	0	3,366,050	3,366,050	68	68	91,739	91,739	91,739	91,739	91,739					
2	0.2	2,493	0	2,493	0	2,493	736	736	696	0	7,355,443	7,355,443	399	399	378	378	0	0	3,989,393	3,989,393				
3	0.2	2,493	0	2,493	0	2,493	1,188	1,133	1,133	0	11,968,178	11,968,178	462	462	437	437	0	0	4,612,735	4,612,735				
4	0.2	2,493	0	2,493	0	2,493	1,722	1,722	1,629	1,629	0	17,204,256	17,204,256	524	524	496	496	0	0	5,236,078	5,236,078			
5	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	22,024,256	22,024,256	0	0	0	0	0	0	0	0			
6	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	27,024,256	27,024,256	0	0	0	0	0	0	0	0			
7	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	32,024,256	32,024,256	0	0	0	0	0	0	0	0			
8	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	37,024,256	37,024,256	0	0	0	0	0	0	0	0			
9	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	42,024,256	42,024,256	0	0	0	0	0	0	0	0			
10	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	47,024,256	47,024,256	0	0	0	0	0	0	0	0			
11	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	52,024,256	52,024,256	0	0	0	0	0	0	0	0			
12	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	57,024,256	57,024,256	0	0	0	0	0	0	0	0			
13	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	62,024,256	62,024,256	0	0	0	0	0	0	0	0			
14	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	67,024,256	67,024,256	0	0	0	0	0	0	0	0			
15	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	72,024,256	72,024,256	0	0	0	0	0	0	0	0			
16	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	77,024,256	77,024,256	0	0	0	0	0	0	0	0			
17	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	82,024,256	82,024,256	0	0	0	0	0	0	0	0			
18	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	87,024,256	87,024,256	0	0	0	0	0	0	0	0			
19	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	92,024,256	92,024,256	0	0	0	0	0	0	0	0			
20	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,629	1,629	0	97,024,256	97,024,256	0	0	0	0	0	0	0	0			
21	0.2	2,493	0	2,493	0	2,493	2,493	2,493	1,365	1,310	1,310	0	102,024,256	102,024,256	0	0	0	0	0	0	0	0		
22	0.2	2,493	0	2,493	0	2,493	2,493	2,493	986	933	933	0	107,024,256	107,024,256	0	0	0	0	0	0	0	0		
23	0.2	2,493	0	2,493	0	2,493	2,493	2,493	524	524	496	496	0	112,024,256	112,024,256	0	0	0	0	0	0	0	0	
Total							57,348	57,348			344,085,121	344,085,121					17,204,256	17,204,256	1,563	1,563	9,377,802	9,377,802	468,890	468,890

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue					
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant
1	\$176	\$87	\$263	\$237,706	\$117,737	\$355,443	\$529,819	\$56,709	\$284,415
2	\$180	\$89	\$269	\$529,819	\$362,423	\$792,243	\$929,819	\$123,920	\$653,740
3	\$183	\$91	\$274	\$879,321	\$435,234	\$1,314,855	\$979,321	\$201,833	\$1,080,954
4	\$187	\$93	\$279	\$1,289,304	\$638,602	\$1,927,906	\$1,289,304	\$289,848	\$1,579,152
5	\$191	\$94	\$285	\$1,516,090	\$651,074	\$1,866,464	\$1,516,090	\$289,848	\$1,634,238
6	\$194	\$96	\$291	\$1,341,392	\$684,401	\$2,005,793	\$1,341,392	\$289,848	\$1,631,239
7	\$198	\$98	\$297	\$1,368,219	\$677,889	\$2,040,909	\$1,368,219	\$289,848	\$1,658,087
8	\$202	\$100	\$302	\$1,395,584	\$691,243	\$2,086,827	\$1,395,584	\$289,848	\$1,685,432
9	\$206	\$102	\$308	\$1,423,496	\$705,088	\$2,128,563	\$1,423,496	\$289,848	\$1,713,343
10	\$210	\$104	\$315	\$1,451,965	\$719,169	\$2,171,135	\$1,451,965	\$289,848	\$1,741,813
11	\$215	\$106	\$321	\$1,481,005	\$733,553	\$2,214,557	\$1,481,005	\$289,848	\$1,770,953
12	\$219	\$108	\$327	\$1,510,625	\$748,224	\$2,258,849	\$1,510,625	\$289,848	\$1,800,473
13	\$223	\$111	\$334	\$1,540,837	\$763,189	\$2,304,028	\$1,540,837	\$289,848	\$1,830,665
14	\$228	\$113	\$341	\$1,571,654	\$778,452	\$2,350,106	\$1,571,654	\$289,848	\$1,861,502
15	\$232	\$115	\$347	\$1,603,087	\$794,021	\$2,397,108	\$1,603,087	\$289,848	\$1,892,935
16	\$237	\$117	\$354	\$1,635,149	\$809,801	\$2,445,050	\$1,635,149	\$289,848	\$1,924,937
17	\$242	\$120	\$361	\$1,667,852	\$826,099	\$2,493,951	\$1,667,852	\$289,848	\$1,957,700
18	\$247	\$122	\$369	\$1,701,209	\$842,621	\$2,543,830	\$1,701,209	\$289,848	\$1,991,057
19	\$251	\$125	\$376	\$1,735,233	\$859,474	\$2,594,707	\$1,735,233	\$289,848	\$2,025,081
20	\$257	\$127	\$384	\$1,769,938	\$876,663	\$2,646,601	\$1,769,938	\$289,848	\$2,059,786
21	\$262	\$130	\$391	\$1,805,119	\$894,245	\$2,700,364	\$1,805,119	\$289,848	\$2,094,257
22	\$267	\$132	\$399	\$1,054,160	\$522,133	\$1,576,293	\$1,054,160	\$165,927	\$1,220,087
23	\$272	\$135	\$407	\$571,648	\$283,142	\$854,790	\$571,648	\$88,215	\$659,863
Total	\$5,079	\$2,516	\$7,595	\$30,526,410	\$15,119,958	\$45,646,368	\$30,526,410	\$5,796,955	\$36,323,965

Utility Program Costs											
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Other	Total	kWh	kWh	kWh	CCF	CCF		
1	\$137,509	\$2,267,519	\$0	\$68,361	\$2,473,389	\$7,761	\$7,761	\$1	\$1	\$27	\$27
2	\$133,107	\$2,740,965	\$0	\$69,951	\$2,944,064	\$4,227	\$4,227	\$0	\$0	\$15	\$15
3	\$142,616	\$3,217,476	\$0	\$70,844	\$3,430,936	\$3,028	\$3,028	\$0	\$0	\$11	\$11
4	\$152,239	\$3,697,132	\$0	\$72,119	\$3,921,490	\$2,407	\$2,407	\$0	\$0	\$8	\$8
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$565,470	\$11,923,092	\$0	\$280,916	\$12,769,478	\$17,422	\$17,422	\$2	\$2	\$61	\$61

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario											
Year	Cumulative Electric					Cumulative Gas					
	Energy	Capacity	TCO	Arbitrary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	
1	\$179,982	\$31,846	\$0	\$0	\$211,828	\$0	\$62,920	\$62,920	\$0	\$62,920	\$62,920
2	\$405,879	\$71,816	\$0	\$0	\$477,695	\$0	\$142,716	\$142,716	\$0	\$142,716	\$142,716
3	\$681,647	\$120,562	\$0	\$0	\$802,138	\$0	\$241,041	\$241,041	\$0	\$241,041	\$241,041
4	\$1,011,074	\$178,898	\$0	\$0	\$1,189,972	\$0	\$359,663	\$359,663	\$0	\$359,663	\$359,663
5	\$1,043,429	\$184,623	\$0	\$0	\$1,228,051	\$0	\$373,330	\$373,330	\$0	\$373,330	\$373,330
6	\$1,076,819	\$190,531	\$0	\$0	\$1,267,349	\$0	\$387,516	\$387,516	\$0	\$387,516	\$387,516
7	\$1,111,277	\$196,628	\$0	\$0	\$1,307,904	\$0	\$402,242	\$402,242	\$0	\$402,242	\$402,242
8	\$1,146,838	\$202,900	\$0	\$0	\$1,349,737	\$0	\$417,527	\$417,527	\$0	\$417,527	\$417,527
9	\$1,183,536	\$209,413	\$0	\$0	\$1,392,949	\$0	\$433,393	\$433,393	\$0	\$433,393	\$433,393
10	\$1,221,410	\$216,114	\$0	\$0	\$1,437,524	\$0	\$449,862	\$449,862	\$0	\$449,862	\$449,862
11	\$1,260,495	\$223,000	\$0	\$0	\$1,483,495	\$0	\$466,957	\$466,957	\$0	\$466,957	\$466,957
12	\$1,300,831	\$230,167	\$0	\$0	\$1,530,997	\$0	\$484,701	\$484,701	\$0	\$484,701	\$484,701
13	\$1,342,457	\$237,532	\$0	\$0	\$1,579,989	\$0	\$503,120	\$503,120	\$0	\$503,120	\$503,120
14	\$1,385,416	\$245,133	\$0	\$0	\$1,630,549	\$0	\$522,238	\$522,238	\$0	\$522,238	\$522,238
15	\$1,429,749	\$252,978	\$0	\$0	\$1,682,727	\$0	\$542,083	\$542,083	\$0	\$542,083	\$542,083
16	\$1,475,501	\$261,073	\$0	\$0	\$1,736,574	\$0	\$562,663	\$562,663	\$0	\$562,663	\$562,663
17	\$1,522,717	\$269,427	\$0	\$0	\$1,792,144	\$0	\$584,065	\$584,065	\$0	\$584,065	\$584,065
18	\$1,571,444	\$278,049	\$0	\$0	\$1,849,493	\$0	\$606,297	\$606,297	\$0	\$606,297	\$606,297
19	\$1,621,730	\$286,946	\$0	\$0	\$1,908,677	\$0	\$629,297	\$629,297	\$0	\$629,297	\$629,297
20	\$1,673,626	\$296,129	\$0	\$0	\$1,969,754	\$0	\$653,210	\$653,210	\$0	\$653,210	\$653,210
21	\$1,389,255	\$245,813	\$0	\$0	\$1,635,067	\$0	\$545,374	\$545,374	\$0	\$545,374	\$545,374
22	\$1,020,389	\$180,546	\$0	\$0	\$1,200,935	\$0	\$402,898	\$402,898	\$0	\$402,898	\$402,898
23	\$559,845	\$99,058	\$0	\$0	\$658,903	\$0	\$222,339	\$222,339	\$0	\$222,339	\$222,339
Totals	\$26,615,243	\$4,709,259	\$0	\$0	\$31,324,502	\$0	\$9,995,433	\$9,995,433	\$0	\$9,995,433	\$9,995,433

Cost-Based Avoided Costs (Net Free Riders/Persistence)											
Year	Cumulative Electric					Cumulative Gas					
	Energy	Capacity	TCO	Arbitrary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel	
1	\$179,982	\$31,846	\$0	\$0	\$211,828	\$0	\$62,920	\$62,920	\$0	\$62,920	\$62,920
2	\$405,879	\$71,816	\$0	\$0	\$477,695	\$0	\$142,716	\$142,716	\$0	\$142,716	\$142,716
3	\$681,647	\$120,562	\$0	\$0	\$802,138	\$0	\$241,041	\$241,041	\$0	\$241,041	\$241,041
4	\$1,011,074	\$178,898	\$0	\$0	\$1,189,972	\$0	\$359,663	\$359,663	\$0	\$359,663	\$359,663
5	\$1,043,429	\$184,623	\$0	\$0	\$1,228,051	\$0	\$373,330	\$373,330	\$0	\$373,330	\$373,330
6	\$1,076,819	\$190,531	\$0	\$0	\$1,267,349	\$0	\$387,516	\$387,516	\$0	\$387,516	\$387,516
7	\$1,111,277	\$196,628	\$0	\$0	\$1,307,904	\$0	\$402,242	\$402,242	\$0	\$402,242	\$402,242
8	\$1,146,838	\$202,900	\$0	\$0	\$1,349,737	\$0	\$417,527	\$417,527	\$0	\$417,527	\$417,527
9	\$1,183,536	\$209,413	\$0	\$0	\$1,392,949	\$0	\$433,393	\$433,393	\$0	\$433,393	\$433,393
10	\$1,221,410	\$216,114	\$0	\$0	\$1,437,524	\$0	\$449,862	\$449,862	\$0	\$449,862	\$449,862
11	\$1,260,495	\$223,000	\$0	\$0	\$1,483,495	\$0	\$466,957	\$466,957	\$0	\$466,957	\$466,957
12	\$1,300,831	\$230,167	\$0	\$0	\$1,530,997	\$0	\$484,701	\$484,701	\$0	\$484,701	\$484,701
13	\$1,342,457	\$237,532	\$0	\$0	\$1,579,989	\$0	\$503,120	\$503,120	\$0	\$503,120	\$503,120
14	\$1,385,416	\$245,133	\$0	\$0	\$1,630,549	\$0	\$522,238	\$522,238	\$0	\$522,238	\$522,238
15	\$1,429,749	\$252,978	\$0	\$0	\$1,682,727	\$0	\$542,083	\$542,083	\$0	\$542,083	\$542,083
16	\$1,475,501	\$261,073	\$0	\$0	\$1,736,574	\$0	\$562,663	\$562,663	\$0	\$562,663	\$562,663
17	\$1,522,717	\$269,427	\$0	\$0	\$1,792,144	\$0	\$584,065	\$584,065	\$0	\$584,065	\$584,065
18	\$1,571,444	\$278,049	\$0	\$0	\$1,849,493	\$0	\$606,297	\$606,297	\$0	\$606,297	\$606,297
19	\$1,621,730	\$286,946	\$0	\$0	\$1,908,677	\$0	\$629,297	\$629,297	\$0	\$629,297	\$629,297
20	\$1,673,626	\$296,129	\$0	\$0	\$1,969,754	\$0	\$653,210	\$653,210	\$0	\$653,210	\$653,210
21	\$1,389,255	\$245,813	\$0	\$0	\$1,635,067	\$0	\$545,374	\$545,374	\$0	\$545,374	\$545,374
22	\$1,020,389	\$180,546	\$0	\$0	\$1,200,935	\$0	\$402,898	\$402,898	\$0	\$402,898	\$402,898
23	\$559,845	\$99,058	\$0	\$0	\$658,903	\$0	\$222,339	\$222,339	\$0	\$222,339	\$222,339
Totals	\$26,615,243	\$4,709,259	\$0	\$0	\$31,324,502	\$0	\$9,995,433	\$9,995,433	\$0	\$9,995,433	\$9,995,433

Participation and Total Participant Costs									
Year	Participation					Total Participant Costs			
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	500	25	500	25	475	475	\$200,000	\$0	\$200,000
2	500	25	1000	50	950	950	\$200,000	\$0	\$200,000
3	500	25	1500	75	1425	1425	\$200,000	\$0	\$200,000
4	500	25	2000	100	1900	1900	\$200,000	\$0	\$200,000
5	0	0	2000	100	1900	1900	\$0	\$0	\$0
6	0	0	2000	100	1900	1900	\$0	\$0	\$0
7	0	0	2000	100	1900	1900	\$0	\$0	\$0
8	0	0	2000	100	1900	1900	\$0	\$0	\$0
9	0	0	2000	100	1900	1900	\$0	\$0	\$0
10	0	0	2000	100	1900	1900	\$0	\$0	\$0
11	0	0	2000	100	1900	1900	\$0	\$0	\$0
12	0	0	2000	100	1900	1900	\$0	\$0	\$0
13	0	0	2000	100	1900	1900	\$0	\$0	\$0
14	0	0	2000	100	1900	1900	\$0	\$0	\$0
15	0	0	2000	100	1900	1900	\$0	\$0	\$0
16	0	0	1500	75	1425	1425	\$0	\$0	\$0
17	0	0	1000	50	950	950	\$0	\$0	\$0
18	0	0	500	25	475	475	\$0	\$0	\$0
Totals	3000	100	30300	1400	28900	28900	\$800,000	\$0	\$800,000

Impacts and Savings																														
Year	Electric Impacts/Savings													Gas Impacts/Savings																
	Cumulative													Yearly Incremental (Per Participant * Incremental Participants)																
	Per Participant													Per Participant																
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	794	754	296	296	296	296	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	0.6	0.6	0.6	0.6	0.0	0.0	794	754	296	296	296	296	0	0	396,750	376,913	0	0	0	0	0	0	0	0	0	0	0	0		
3	0.6	0.6	0.6	0.6	0.0	0.0	794	754	593	593	593	593	0	0	793,500	753,825	296	282	0	0	396,750	376,913	0	0	0	0	0	0	0	
4	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	296	282	296	282	0	0	396,750	376,913	0	0	0	0	0	0
5	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0.6	0.6	0.6	0.6	0.0	0.0	794	754	1,185	1,126	1,185	1,126	0	0	1,587,000	1,507,650	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0.6	0.6	0.6	0.6	0.0	0.0	794	754	893	845	893	845	0	0	1,190,250	1,130,738	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0.6	0.6	0.6	0.6	0.0	0.0	794	754	593	593	593	593	0	0	793,500	753,825	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0.6	0.6	0.6	0.6	0.0	0.0	794	754	296	282	296	282	0	0	396,750	376,913	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals							14,283	13,669							23,805,000	22,614,750					1,587,000	1,507,650	0	0	0	0	0	0		

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$59	\$0	\$59	\$28,235	\$0	\$28,235	\$28,235	\$0	\$28,235
2	\$61	\$0	\$61	\$57,599	\$0	\$57,599	\$57,599	\$0	\$57,599
3	\$62	\$0	\$62	\$86,127	\$0	\$86,127	\$86,127	\$0	\$86,127
4	\$63	\$0	\$63	\$119,852	\$0	\$119,852	\$119,852	\$0	\$119,852
5	\$64	\$0	\$64	\$122,449	\$0	\$122,449	\$122,449	\$0	\$122,449
6	\$66	\$0	\$66	\$124,694	\$0	\$124,694	\$124,694	\$0	\$124,694
7	\$67	\$0	\$67	\$127,188	\$0	\$127,188	\$127,188	\$0	\$127,188
8	\$68	\$0	\$68	\$129,732	\$0	\$129,732	\$129,732	\$0	\$129,732
9	\$70	\$0	\$70	\$132,327	\$0	\$132,327	\$132,327	\$0	\$132,327
10	\$71	\$0	\$71	\$134,973	\$0	\$134,973	\$134,973	\$0	\$134,973
11	\$72	\$0	\$72	\$137,673	\$0	\$137,673	\$137,673	\$0	\$137,673
12	\$74	\$0	\$74	\$140,426	\$0	\$140,426	\$140,426	\$0	\$140,426
13	\$75	\$0	\$75	\$143,235	\$0	\$143,235	\$143,235	\$0	\$143,235
14	\$77	\$0	\$77	\$146,099	\$0	\$146,099	\$146,099	\$0	\$146,099
15	\$78	\$0	\$78	\$149,021	\$0	\$149,021	\$149,021	\$0	\$149,021
16	\$80	\$0	\$80	\$114,001	\$0	\$114,001	\$114,001	\$0	\$114,001
17	\$82	\$0	\$82	\$77,521	\$0	\$77,521	\$77,521	\$0	\$77,521
18	\$83	\$0	\$83	\$39,536	\$0	\$39,536	\$39,536	\$0	\$39,536
Totals	\$1,273	\$0	\$1,273	\$2,012,488	\$0	\$2,012,488	\$2,012,488	\$0	\$2,012,488

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-kWh	\$/CCF-kWh
1	\$0	\$0	\$100,000	\$0	\$100,000	\$337	\$355	\$0	\$0	\$0
2	\$0	\$0	\$100,000	\$0	\$100,000	\$169	\$178	\$0	\$0	\$0
3	\$0	\$0	\$100,000	\$0	\$100,000	\$112	\$118	\$0	\$0	\$0
4	\$0	\$0	\$100,000	\$0	\$100,000	\$64	\$69	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$400,000	\$0	\$400,000	\$703	\$740	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$32,298	\$28,129	\$0	\$0	\$60,428	\$0	\$0	\$0	\$0
2	\$66,663	\$58,059	\$0	\$0	\$124,722	\$0	\$0	\$0	\$0
3	\$103,195	\$89,875	\$0	\$0	\$193,070	\$0	\$0	\$0	\$0
4	\$141,998	\$123,669	\$0	\$0	\$265,665	\$0	\$0	\$0	\$0
5	\$148,540	\$127,628	\$0	\$0	\$274,166	\$0	\$0	\$0	\$0
6	\$151,229	\$131,710	\$0	\$0	\$282,939	\$0	\$0	\$0	\$0
7	\$156,069	\$135,925	\$0	\$0	\$291,993	\$0	\$0	\$0	\$0
8	\$161,063	\$140,274	\$0	\$0	\$301,337	\$0	\$0	\$0	\$0
9	\$166,217	\$144,763	\$0	\$0	\$310,980	\$0	\$0	\$0	\$0
10	\$171,536	\$149,396	\$0	\$0	\$320,931	\$0	\$0	\$0	\$0
11	\$177,025	\$154,176	\$0	\$0	\$331,201	\$0	\$0	\$0	\$0
12	\$182,690	\$159,110	\$0	\$0	\$341,799	\$0	\$0	\$0	\$0
13	\$188,536	\$164,201	\$0	\$0	\$352,737	\$0	\$0	\$0	\$0
14	\$194,569	\$169,456	\$0	\$0	\$364,025	\$0	\$0	\$0	\$0
15	\$200,795	\$174,878	\$0	\$0	\$375,673	\$0	\$0	\$0	\$0
16	\$155,415	\$135,356	\$0	\$0	\$290,771	\$0	\$0	\$0	\$0
17	\$108,928	\$93,125	\$0	\$0	\$200,051	\$0	\$0	\$0	\$0
18	\$55,174	\$48,052	\$0	\$0	\$103,226	\$0	\$0	\$0	\$0
Totals	\$2,557,934	\$2,227,781	\$0	\$0	\$4,785,715	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$32,298	\$28,129	\$0	\$0	\$60,428	\$0	\$0	\$0	\$0
2	\$66,663	\$58,059	\$0	\$0	\$124,722	\$0	\$0	\$0	\$0
3	\$103,195	\$89,875	\$0	\$0	\$193,070	\$0	\$0	\$0	\$0
4	\$141,998	\$123,669	\$0	\$0	\$265,665	\$0	\$0	\$0	\$0
5	\$148,540	\$127,628	\$0	\$0	\$274,166	\$0	\$0	\$0	\$0
6	\$151,229	\$131,710	\$0	\$0	\$282,939	\$0	\$0	\$0	\$0
7	\$156,069	\$135,925	\$0	\$0	\$291,993	\$0	\$0	\$0	\$0
8	\$161,063	\$140,274	\$0	\$0	\$301,337	\$0	\$0	\$0	\$0
9	\$166,217	\$144,763	\$0	\$0	\$310,980	\$0	\$0	\$0	\$0
10	\$171,536	\$149,396	\$0	\$0	\$320,931	\$0	\$0	\$0	\$0
11	\$177,025	\$154,176	\$0	\$0	\$331,201	\$0	\$0	\$0	\$0
12	\$182,690	\$159,110	\$0	\$0	\$341,799	\$0	\$0	\$0	\$0
13	\$188,536	\$164,201	\$0	\$0	\$352,737	\$0	\$0	\$0	\$0
14	\$194,569	\$169,456	\$0	\$0	\$364,025	\$0	\$0	\$0	\$0
15	\$200,795	\$174,878	\$0	\$0	\$375,673	\$0	\$0	\$0	\$0
16	\$155,415	\$135,356	\$0	\$0	\$290,771	\$0	\$0	\$0	\$0
17	\$108,928	\$93,125	\$0	\$0	\$200,051	\$0	\$0	\$0	\$0
18	\$55,174	\$48,052	\$0	\$0	\$103,226	\$0	\$0	\$0	\$0
Totals	\$2,557,934	\$2,227,781	\$0	\$0	\$4,785,715	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$560,000	\$0	\$560,000
2	700	140	1400	280	1120	1120	\$560,000	\$0	\$560,000
3	700	140	2100	420	1680	1680	\$560,000	\$0	\$560,000
4	700	140	2800	560	2240	2240	\$560,000	\$0	\$560,000
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	3800	880	42000	8400	33600	33600	\$2,340,000	\$0	\$2,340,000

Impacts and Savings																																		
Year	Per Participant										Electric Impacts/Savings										Gas Impacts/Savings													
	kW (net)		Summer Con kW		Summer Con (net)		Winter Con kW		Winter Con (net)		kWh		kWh (net)		kW (net)		Summer Con kW		Summer Con (net)		Winter Con kW		Winter Con (net)		kWh		kWh (net)		CO ₂ (net)		CO ₂ (net)		CO ₂ (net)	
	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	kWh	kWh (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)	CO ₂ (net)			
1	0	0	0	0	0	1,859	1,487	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	0	0	0	0	0		
2	0	0	0	0	0	1,859	1,487	0	0	0	0	2,602,172	2,081,738	0	0	0	0	0	0	2,602,172	2,081,738	0	0	0	0	0	0	0	0	0	0	0		
3	0	0	0	0	0	1,859	1,487	0	0	0	0	3,903,258	3,122,607	0	0	0	0	0	0	3,903,258	3,122,607	0	0	0	0	0	0	0	0	0	0	0		
4	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
5	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
6	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
7	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
8	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
9	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
10	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
11	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
12	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
13	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
14	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
15	0	0	0	0	0	1,859	1,487	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	5,204,344	4,163,475	0	0	0	0	0	0	0	0	0	0	0		
16	0	0	0	0	0	1,859	1,487	0	0	0	0	2,602,172	2,081,738	0	0	0	0	0	0	2,602,172	2,081,738	0	0	0	0	0	0	0	0	0	0	0		
17	0	0	0	0	0	1,859	1,487	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	0	0	0	0	0		
18	0	0	0	0	0	1,859	1,487	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	1,301,086	1,040,869	0	0	0	0	0	0	0	0	0	0	0		
Totals																																		

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$139	\$0	\$139	\$77,972	\$0	\$77,972	\$77,972	\$0	\$77,972
2	\$142	\$0	\$142	\$159,064	\$0	\$159,064	\$159,064	\$0	\$159,064
3	\$145	\$0	\$145	\$243,368	\$0	\$243,368	\$243,368	\$0	\$243,368
4	\$148	\$0	\$148	\$330,980	\$0	\$330,980	\$330,980	\$0	\$330,980
5	\$151	\$0	\$151	\$337,600	\$0	\$337,600	\$337,600	\$0	\$337,600
6	\$154	\$0	\$154	\$344,352	\$0	\$344,352	\$344,352	\$0	\$344,352
7	\$157	\$0	\$157	\$351,239	\$0	\$351,239	\$351,239	\$0	\$351,239
8	\$160	\$0	\$160	\$358,263	\$0	\$358,263	\$358,263	\$0	\$358,263
9	\$163	\$0	\$163	\$365,429	\$0	\$365,429	\$365,429	\$0	\$365,429
10	\$166	\$0	\$166	\$372,737	\$0	\$372,737	\$372,737	\$0	\$372,737
11	\$170	\$0	\$170	\$380,192	\$0	\$380,192	\$380,192	\$0	\$380,192
12	\$173	\$0	\$173	\$387,796	\$0	\$387,796	\$387,796	\$0	\$387,796
13	\$177	\$0	\$177	\$395,552	\$0	\$395,552	\$395,552	\$0	\$395,552
14	\$180	\$0	\$180	\$403,463	\$0	\$403,463	\$403,463	\$0	\$403,463
15	\$184	\$0	\$184	\$411,532	\$0	\$411,532	\$411,532	\$0	\$411,532
16	\$187	\$0	\$187	\$314,822	\$0	\$314,822	\$314,822	\$0	\$314,822
17	\$191	\$0	\$191	\$214,079	\$0	\$214,079	\$214,079	\$0	\$214,079
18	\$195	\$0	\$195	\$109,180	\$0	\$109,180	\$109,180	\$0	\$109,180
Totals	\$2,981	\$0	\$2,981	\$5,557,618	\$0	\$5,557,618	\$5,557,618	\$0	\$5,557,618

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$280,000	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Constr	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$89,193	\$0	\$0	\$0	\$89,193	\$0	\$0	\$0	\$0
2	\$184,095	\$0	\$0	\$0	\$184,095	\$0	\$0	\$0	\$0
3	\$284,979	\$0	\$0	\$0	\$284,979	\$0	\$0	\$0	\$0
4	\$392,131	\$0	\$0	\$0	\$392,131	\$0	\$0	\$0	\$0
5	\$404,680	\$0	\$0	\$0	\$404,680	\$0	\$0	\$0	\$0
6	\$417,629	\$0	\$0	\$0	\$417,629	\$0	\$0	\$0	\$0
7	\$430,994	\$0	\$0	\$0	\$430,994	\$0	\$0	\$0	\$0
8	\$444,785	\$0	\$0	\$0	\$444,785	\$0	\$0	\$0	\$0
9	\$459,018	\$0	\$0	\$0	\$459,018	\$0	\$0	\$0	\$0
10	\$473,707	\$0	\$0	\$0	\$473,707	\$0	\$0	\$0	\$0
11	\$488,866	\$0	\$0	\$0	\$488,866	\$0	\$0	\$0	\$0
12	\$504,509	\$0	\$0	\$0	\$504,509	\$0	\$0	\$0	\$0
13	\$520,654	\$0	\$0	\$0	\$520,654	\$0	\$0	\$0	\$0
14	\$537,315	\$0	\$0	\$0	\$537,315	\$0	\$0	\$0	\$0
15	\$554,509	\$0	\$0	\$0	\$554,509	\$0	\$0	\$0	\$0
16	\$429,190	\$0	\$0	\$0	\$429,190	\$0	\$0	\$0	\$0
17	\$295,283	\$0	\$0	\$0	\$295,283	\$0	\$0	\$0	\$0
18	\$152,366	\$0	\$0	\$0	\$152,366	\$0	\$0	\$0	\$0
Totals	\$7,063,903	\$0	\$0	\$0	\$7,063,903	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Constr	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$89,193	\$0	\$0	\$0	\$89,193	\$0	\$0	\$0	\$0
2	\$184,095	\$0	\$0	\$0	\$184,095	\$0	\$0	\$0	\$0
3	\$284,979	\$0	\$0	\$0	\$284,979	\$0	\$0	\$0	\$0
4	\$392,131	\$0	\$0	\$0	\$392,131	\$0	\$0	\$0	\$0
5	\$404,680	\$0	\$0	\$0	\$404,680	\$0	\$0	\$0	\$0
6	\$417,629	\$0	\$0	\$0	\$417,629	\$0	\$0	\$0	\$0
7	\$430,994	\$0	\$0	\$0	\$430,994	\$0	\$0	\$0	\$0
8	\$444,785	\$0	\$0	\$0	\$444,785	\$0	\$0	\$0	\$0
9	\$459,018	\$0	\$0	\$0	\$459,018	\$0	\$0	\$0	\$0
10	\$473,707	\$0	\$0	\$0	\$473,707	\$0	\$0	\$0	\$0
11	\$488,866	\$0	\$0	\$0	\$488,866	\$0	\$0	\$0	\$0
12	\$504,509	\$0	\$0	\$0	\$504,509	\$0	\$0	\$0	\$0
13	\$520,654	\$0	\$0	\$0	\$520,654	\$0	\$0	\$0	\$0
14	\$537,315	\$0	\$0	\$0	\$537,315	\$0	\$0	\$0	\$0
15	\$554,509	\$0	\$0	\$0	\$554,509	\$0	\$0	\$0	\$0
16	\$429,190	\$0	\$0	\$0	\$429,190	\$0	\$0	\$0	\$0
17	\$295,283	\$0	\$0	\$0	\$295,283	\$0	\$0	\$0	\$0
18	\$152,366	\$0	\$0	\$0	\$152,366	\$0	\$0	\$0	\$0
Totals	\$7,063,903	\$0	\$0	\$0	\$7,063,903	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	500	100	500	100	400	400	\$350,000	\$0	\$350,000
2	500	100	1000	200	800	800	\$350,000	\$0	\$350,000
3	500	100	1500	300	1200	1200	\$350,000	\$0	\$350,000
4	500	100	2000	400	1600	1600	\$350,000	\$0	\$350,000
5	0	0	2000	400	1600	1600	\$0	\$0	\$0
6	0	0	2000	400	1600	1600	\$0	\$0	\$0
7	0	0	2000	400	1600	1600	\$0	\$0	\$0
8	0	0	2000	400	1600	1600	\$0	\$0	\$0
9	0	0	2000	400	1600	1600	\$0	\$0	\$0
10	0	0	2000	400	1600	1600	\$0	\$0	\$0
11	0	0	2000	400	1600	1600	\$0	\$0	\$0
12	0	0	2000	400	1600	1600	\$0	\$0	\$0
13	0	0	2000	400	1600	1600	\$0	\$0	\$0
14	0	0	2000	400	1600	1600	\$0	\$0	\$0
15	0	0	2000	400	1600	1600	\$0	\$0	\$0
16	0	0	1500	300	1200	1200	\$0	\$0	\$0
17	0	0	1000	200	800	800	\$0	\$0	\$0
18	0	0	500	100	400	400	\$0	\$0	\$0
Totals	3000	400	30000	8000	24000	24000	\$1,400,000	\$0	\$1,400,000

Impacts and Savings																												
Year	Per Participant										Electric Impacts/Savings										Gas Impacts/Savings							
	kW (net)		Summer Con kW		Winter Con kW		WtH (net)		WtH (net)		kW (net)		Summer Con kW		Winter Con kW		WtH (net)		WtH (net)		kW (net)		Summer Con kW		Winter Con kW		WtH (net)	
	kW (net)	Summer Con kW	Winter Con kW	WtH (net)	WtH (net)	kW (net)	Summer Con kW	Winter Con kW	WtH (net)	WtH (net)	kW (net)	Summer Con kW	Winter Con kW	WtH (net)	WtH (net)	kW (net)	Summer Con kW	Winter Con kW	WtH (net)	WtH (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)		
1	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	2,626	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals						47,260	37,808				78,765,984	63,012,787				5,251,066	4,200,852	0	0	0	0	0	0	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$197	\$0	\$197	\$78,672	\$0	\$78,672	\$78,672	\$0	\$78,672
2	\$201	\$0	\$201	\$160,492	\$0	\$160,492	\$160,492	\$0	\$160,492
3	\$205	\$0	\$205	\$245,592	\$0	\$245,592	\$245,592	\$0	\$245,592
4	\$209	\$0	\$209	\$333,951	\$0	\$333,951	\$333,951	\$0	\$333,951
5	\$213	\$0	\$213	\$340,630	\$0	\$340,630	\$340,630	\$0	\$340,630
6	\$217	\$0	\$217	\$347,443	\$0	\$347,443	\$347,443	\$0	\$347,443
7	\$221	\$0	\$221	\$354,392	\$0	\$354,392	\$354,392	\$0	\$354,392
8	\$226	\$0	\$226	\$361,480	\$0	\$361,480	\$361,480	\$0	\$361,480
9	\$230	\$0	\$230	\$368,709	\$0	\$368,709	\$368,709	\$0	\$368,709
10	\$235	\$0	\$235	\$376,083	\$0	\$376,083	\$376,083	\$0	\$376,083
11	\$240	\$0	\$240	\$383,605	\$0	\$383,605	\$383,605	\$0	\$383,605
12	\$245	\$0	\$245	\$391,277	\$0	\$391,277	\$391,277	\$0	\$391,277
13	\$249	\$0	\$249	\$399,103	\$0	\$399,103	\$399,103	\$0	\$399,103
14	\$254	\$0	\$254	\$407,085	\$0	\$407,085	\$407,085	\$0	\$407,085
15	\$260	\$0	\$260	\$415,226	\$0	\$415,226	\$415,226	\$0	\$415,226
16	\$265	\$0	\$265	\$317,648	\$0	\$317,648	\$317,648	\$0	\$317,648
17	\$270	\$0	\$270	\$216,001	\$0	\$216,001	\$216,001	\$0	\$216,001
18	\$275	\$0	\$275	\$110,160	\$0	\$110,160	\$110,160	\$0	\$110,160
Totals	\$4,211	\$0	\$4,211	\$5,607,511	\$0	\$5,607,511	\$5,607,511	\$0	\$5,607,511

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ	
1	\$0	\$0	\$50,000	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	
2	\$0	\$0	\$50,000	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	
3	\$0	\$0	\$50,000	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	
4	\$0	\$0	\$50,000	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Totals	\$0	\$0	\$200,000	\$0	\$200,000	\$0	\$0	\$0	\$0	\$0	

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$63,392	\$0	\$0	\$0	\$63,392	\$0	\$0	\$0		
2	\$130,841	\$0	\$0	\$0	\$130,841	\$0	\$0	\$0		
3	\$202,642	\$0	\$0	\$0	\$202,642	\$0	\$0	\$0		
4	\$278,698	\$0	\$0	\$0	\$278,698	\$0	\$0	\$0		
5	\$287,617	\$0	\$0	\$0	\$287,617	\$0	\$0	\$0		
6	\$296,820	\$0	\$0	\$0	\$296,820	\$0	\$0	\$0		
7	\$306,319	\$0	\$0	\$0	\$306,319	\$0	\$0	\$0		
8	\$316,121	\$0	\$0	\$0	\$316,121	\$0	\$0	\$0		
9	\$326,237	\$0	\$0	\$0	\$326,237	\$0	\$0	\$0		
10	\$336,676	\$0	\$0	\$0	\$336,676	\$0	\$0	\$0		
11	\$347,450	\$0	\$0	\$0	\$347,450	\$0	\$0	\$0		
12	\$358,568	\$0	\$0	\$0	\$358,568	\$0	\$0	\$0		
13	\$370,042	\$0	\$0	\$0	\$370,042	\$0	\$0	\$0		
14	\$381,884	\$0	\$0	\$0	\$381,884	\$0	\$0	\$0		
15	\$394,104	\$0	\$0	\$0	\$394,104	\$0	\$0	\$0		
16	\$305,037	\$0	\$0	\$0	\$305,037	\$0	\$0	\$0		
17	\$209,865	\$0	\$0	\$0	\$209,865	\$0	\$0	\$0		
18	\$108,290	\$0	\$0	\$0	\$108,290	\$0	\$0	\$0		
Totals	\$5,020,503	\$0	\$0	\$0	\$5,020,503	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Classify	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$63,392	\$0	\$0	\$0	\$63,392	\$0	\$0	\$0		
2	\$130,841	\$0	\$0	\$0	\$130,841	\$0	\$0	\$0		
3	\$202,642	\$0	\$0	\$0	\$202,642	\$0	\$0	\$0		
4	\$278,698	\$0	\$0	\$0	\$278,698	\$0	\$0	\$0		
5	\$287,617	\$0	\$0	\$0	\$287,617	\$0	\$0	\$0		
6	\$296,820	\$0	\$0	\$0	\$296,820	\$0	\$0	\$0		
7	\$306,319	\$0	\$0	\$0	\$306,319	\$0	\$0	\$0		
8	\$316,121	\$0	\$0	\$0	\$316,121	\$0	\$0	\$0		
9	\$326,237	\$0	\$0	\$0	\$326,237	\$0	\$0	\$0		
10	\$336,676	\$0	\$0	\$0	\$336,676	\$0	\$0	\$0		
11	\$347,450	\$0	\$0	\$0	\$347,450	\$0	\$0	\$0		
12	\$358,568	\$0	\$0	\$0	\$358,568	\$0	\$0	\$0		
13	\$370,042	\$0	\$0	\$0	\$370,042	\$0	\$0	\$0		
14	\$381,884	\$0	\$0	\$0	\$381,884	\$0	\$0	\$0		
15	\$394,104	\$0	\$0	\$0	\$394,104	\$0	\$0	\$0		
16	\$305,037	\$0	\$0	\$0	\$305,037	\$0	\$0	\$0		
17	\$209,865	\$0	\$0	\$0	\$209,865	\$0	\$0	\$0		
18	\$108,290	\$0	\$0	\$0	\$108,290	\$0	\$0	\$0		
Totals	\$5,020,503	\$0	\$0	\$0	\$5,020,503	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	4500	450	4500	450	4500	4500	\$900,000	\$0	\$900,000
2	4500	450	9000	900	9000	9000	\$900,000	\$0	\$900,000
3	4500	450	13500	1350	12150	12150	\$900,000	\$0	\$900,000
4	4500	450	18000	1800	16200	16200	\$900,000	\$0	\$900,000
5	0	0	18000	1800	16200	16200	\$0	\$0	\$0
6	0	0	18000	1800	16200	16200	\$0	\$0	\$0
7	0	0	18000	1800	16200	16200	\$0	\$0	\$0
8	0	0	18000	1800	16200	16200	\$0	\$0	\$0
9	0	0	18000	1800	16200	16200	\$0	\$0	\$0
10	0	0	18000	1800	16200	16200	\$0	\$0	\$0
11	0	0	18000	1800	16200	16200	\$0	\$0	\$0
12	0	0	18000	1800	16200	16200	\$0	\$0	\$0
13	0	0	18000	1800	16200	16200	\$0	\$0	\$0
14	0	0	18000	1800	16200	16200	\$0	\$0	\$0
15	0	0	13500	1350	12150	12150	\$0	\$0	\$0
16	0	0	9000	900	8100	8100	\$0	\$0	\$0
17	0	0	4500	450	4050	4050	\$0	\$0	\$0
Totals	18000	1800	252000	25200	228000	228000	\$3,600,000	\$0	\$3,600,000

Impacts and Savings																															
Year	Per Participant										Electric Impacts/Savings										Gas Impacts/Savings										
	kW (net)		Summer Cdn kW		Summer Cdn (net)		Winter Cdn kW		Winter Cdn (net)		kWh (net)		kWh (net)		kW (net)		Summer Cdn kW		Summer Cdn (net)		Winter Cdn kW		Winter Cdn (net)		CO2 (net)		CO2 (net)				
	kW	kW (net)	Summer Cdn kW	Summer Cdn (net)	Winter Cdn kW	Winter Cdn (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Cdn kW	Summer Cdn (net)	Winter Cdn kW	Winter Cdn (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)			
1	0.12	0.11	0.12	0.11	0.13	0.12	809	728	532	479	508	475	581	523	3,641,835	3,277,651	532	479	528	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	
2	0.12	0.11	0.12	0.11	0.13	0.12	809	728	1,064	958	1,056	951	1,162	1,046	7,283,670	6,555,303	532	479	528	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	
3	0.12	0.11	0.12	0.11	0.13	0.12	809	728	1,597	1,437	1,584	1,426	1,743	1,568	10,825,504	9,832,954	532	479	528	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	
4	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	532	479	528	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	
5	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.12	0.11	0.12	0.11	0.13	0.12	809	728	2,129	1,916	2,112	1,901	2,323	2,091	14,567,339	13,110,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.12	0.11	0.12	0.11	0.13	0.12	809	728	1,597	1,437	1,584	1,426	1,743	1,568	10,825,504	9,832,954	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.12	0.11	0.12	0.11	0.13	0.12	809	728	1,064	958	1,056	951	1,162	1,046	7,283,670	6,555,303	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.12	0.11	0.12	0.11	0.13	0.12	809	728	532	479	508	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.12	0.11	0.12	0.11	0.13	0.12	809	728	532	479	508	475	581	523	3,641,835	3,277,651	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals									13,758	12,382					203,042,747	183,548,472								14,667,339	13,110,605	0	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$61	\$0	\$61	\$245,532	\$0	\$245,532	\$245,532	\$0	\$245,532
2	\$62	\$0	\$62	\$500,885	\$0	\$500,885	\$500,885	\$0	\$500,885
3	\$63	\$0	\$63	\$766,354	\$0	\$766,354	\$766,354	\$0	\$766,354
4	\$64	\$0	\$64	\$1,042,242	\$0	\$1,042,242	\$1,042,242	\$0	\$1,042,242
5	\$66	\$0	\$66	\$1,063,086	\$0	\$1,063,086	\$1,063,086	\$0	\$1,063,086
6	\$67	\$0	\$67	\$1,084,348	\$0	\$1,084,348	\$1,084,348	\$0	\$1,084,348
7	\$68	\$0	\$68	\$1,106,035	\$0	\$1,106,035	\$1,106,035	\$0	\$1,106,035
8	\$70	\$0	\$70	\$1,128,156	\$0	\$1,128,156	\$1,128,156	\$0	\$1,128,156
9	\$71	\$0	\$71	\$1,150,719	\$0	\$1,150,719	\$1,150,719	\$0	\$1,150,719
10	\$72	\$0	\$72	\$1,173,733	\$0	\$1,173,733	\$1,173,733	\$0	\$1,173,733
11	\$74	\$0	\$74	\$1,197,208	\$0	\$1,197,208	\$1,197,208	\$0	\$1,197,208
12	\$75	\$0	\$75	\$1,221,152	\$0	\$1,221,152	\$1,221,152	\$0	\$1,221,152
13	\$77	\$0	\$77	\$1,245,575	\$0	\$1,245,575	\$1,245,575	\$0	\$1,245,575
14	\$78	\$0	\$78	\$1,270,487	\$0	\$1,270,487	\$1,270,487	\$0	\$1,270,487
15	\$80	\$0	\$80	\$971,922	\$0	\$971,922	\$971,922	\$0	\$971,922
16	\$82	\$0	\$82	\$660,907	\$0	\$660,907	\$660,907	\$0	\$660,907
17	\$83	\$0	\$83	\$337,063	\$0	\$337,063	\$337,063	\$0	\$337,063
Totals	\$1,213	\$0	\$1,213	\$16,165,405	\$0	\$16,165,405	\$16,165,405	\$0	\$16,165,405

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr	
1	\$0	\$0	\$337,500	\$0	\$337,500	\$304	\$138	\$0	\$0	\$0	
2	\$0	\$0	\$337,500	\$0	\$337,500	\$152	\$169	\$0	\$0	\$0	
3	\$0	\$0	\$337,500	\$0	\$337,500	\$101	\$113	\$0	\$0	\$0	
4	\$0	\$0	\$337,500	\$0	\$337,500	\$76	\$85	\$0	\$0	\$0	
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Totals	\$0	\$0	\$1,350,000	\$0	\$1,350,000	\$634	\$704	\$0	\$0	\$0	

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$137,841	\$47,492	\$0	\$0	\$185,333	\$0	\$0	\$0		
2	\$284,503	\$98,024	\$0	\$0	\$382,527	\$0	\$0	\$0		
3	\$440,410	\$151,741	\$0	\$0	\$592,151	\$0	\$0	\$0		
4	\$608,005	\$208,796	\$0	\$0	\$814,800	\$0	\$0	\$0		
5	\$625,397	\$215,477	\$0	\$0	\$840,874	\$0	\$0	\$0		
6	\$645,410	\$222,372	\$0	\$0	\$867,782	\$0	\$0	\$0		
7	\$666,063	\$229,488	\$0	\$0	\$895,551	\$0	\$0	\$0		
8	\$687,377	\$236,852	\$0	\$0	\$924,209	\$0	\$0	\$0		
9	\$709,373	\$244,410	\$0	\$0	\$953,783	\$0	\$0	\$0		
10	\$732,073	\$252,232	\$0	\$0	\$984,304	\$0	\$0	\$0		
11	\$755,499	\$260,303	\$0	\$0	\$1,015,802	\$0	\$0	\$0		
12	\$779,675	\$268,633	\$0	\$0	\$1,048,308	\$0	\$0	\$0		
13	\$804,625	\$277,229	\$0	\$0	\$1,081,853	\$0	\$0	\$0		
14	\$830,373	\$286,100	\$0	\$0	\$1,116,473	\$0	\$0	\$0		
15	\$842,708	\$221,442	\$0	\$0	\$864,150	\$0	\$0	\$0		
16	\$442,183	\$162,352	\$0	\$0	\$594,535	\$0	\$0	\$0		
17	\$228,167	\$78,614	\$0	\$0	\$306,780	\$0	\$0	\$0		
Totals	\$10,017,680	\$3,451,635	\$0	\$0	\$13,469,215	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$137,841	\$47,492	\$0	\$0	\$185,333	\$0	\$0	\$0		
2	\$284,503	\$98,024	\$0	\$0	\$382,527	\$0	\$0	\$0		
3	\$440,410	\$151,741	\$0	\$0	\$592,151	\$0	\$0	\$0		
4	\$608,005	\$208,796	\$0	\$0	\$814,800	\$0	\$0	\$0		
5	\$625,397	\$215,477	\$0	\$0	\$840,874	\$0	\$0	\$0		
6	\$645,410	\$222,372	\$0	\$0	\$867,782	\$0	\$0	\$0		
7	\$666,063	\$229,488	\$0	\$0	\$895,551	\$0	\$0	\$0		
8	\$687,377	\$236,852	\$0	\$0	\$924,209	\$0	\$0	\$0		
9	\$709,373	\$244,410	\$0	\$0	\$953,783	\$0	\$0	\$0		
10	\$732,073	\$252,232	\$0	\$0	\$984,304	\$0	\$0	\$0		
11	\$755,499	\$260,303	\$0	\$0	\$1,015,802	\$0	\$0	\$0		
12	\$779,675	\$268,633	\$0	\$0	\$1,048,308	\$0	\$0	\$0		
13	\$804,625	\$277,229	\$0	\$0	\$1,081,853	\$0	\$0	\$0		
14	\$830,373	\$286,100	\$0	\$0	\$1,116,473	\$0	\$0	\$0		
15	\$842,708	\$221,442	\$0	\$0	\$864,150	\$0	\$0	\$0		
16	\$442,183	\$162,352	\$0	\$0	\$594,535	\$0	\$0	\$0		
17	\$228,167	\$78,614	\$0	\$0	\$306,780	\$0	\$0	\$0		
Totals	\$10,017,680	\$3,451,635	\$0	\$0	\$13,469,215	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ no free riders)	One-Time Investment	Annual Investment	Total Costs
1	3500	350	3500	350	3150	3150	\$525,000	\$0	\$525,000
2	3500	350	7000	700	6300	6300	\$525,000	\$0	\$525,000
3	3500	350	10500	1050	9450	9450	\$525,000	\$0	\$525,000
4	3500	350	14000	1400	12600	12600	\$525,000	\$0	\$525,000
5	0	0	14000	1400	12600	12600	\$0	\$0	\$0
6	0	0	14000	1400	12600	12600	\$0	\$0	\$0
7	0	0	14000	1400	12600	12600	\$0	\$0	\$0
8	0	0	14000	1400	12600	12600	\$0	\$0	\$0
9	0	0	14000	1400	12600	12600	\$0	\$0	\$0
10	0	0	14000	1400	12600	12600	\$0	\$0	\$0
11	0	0	10500	1050	9450	9450	\$0	\$0	\$0
12	0	0	7000	700	6300	6300	\$0	\$0	\$0
13	0	0	3500	350	3150	3150	\$0	\$0	\$0
Totals	14000	1400	140000	14000	126000	126000	\$2,100,000	\$0	\$2,100,000

Impacts and Savings																												
Year	Electric Impacts/Savings														Gas Impacts/Savings													
	Per Participant														Per Participant													
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2	kWh (est)	kWh	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2	kWh (est)	kWh	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2	CCF (est)				
1	0.07	0.06	0.04	0.04	0.04	292	263	235	212	155	140	137	123	1,022,109	919,898	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.07	0.06	0.04	0.04	0.04	292	263	470	423	311	280	274	247	2,044,218	1,839,796	235	212	155	140	137	123	1,022,109	919,898	0	0	0	0	0
3	0.07	0.06	0.04	0.04	0.04	292	263	705	635	466	419	411	370	3,066,327	2,759,694	235	212	155	140	137	123	1,022,109	919,898	0	0	0	0	0
4	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	235	212	155	140	137	123	1,022,109	919,898	0	0	0	0	0
5	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.07	0.06	0.04	0.04	0.04	292	263	940	846	621	559	548	493	4,088,436	3,679,592	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.07	0.06	0.04	0.04	0.04	292	263	705	635	466	419	411	370	3,066,327	2,759,694	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.07	0.06	0.04	0.04	0.04	292	263	470	423	311	280	274	247	2,044,218	1,839,796	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.07	0.06	0.04	0.04	0.04	292	263	235	212	155	140	137	123	1,022,109	919,898	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals																												

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$22	\$0	\$22	\$68,910	\$0	\$68,910	\$68,910	\$0	\$68,910
2	\$22	\$0	\$22	\$140,577	\$0	\$140,577	\$140,577	\$0	\$140,577
3	\$23	\$0	\$23	\$215,083	\$0	\$215,083	\$215,083	\$0	\$215,083
4	\$23	\$0	\$23	\$292,513	\$0	\$292,513	\$292,513	\$0	\$292,513
5	\$24	\$0	\$24	\$298,363	\$0	\$298,363	\$298,363	\$0	\$298,363
6	\$24	\$0	\$24	\$304,331	\$0	\$304,331	\$304,331	\$0	\$304,331
7	\$25	\$0	\$25	\$310,417	\$0	\$310,417	\$310,417	\$0	\$310,417
8	\$25	\$0	\$25	\$316,626	\$0	\$316,626	\$316,626	\$0	\$316,626
9	\$26	\$0	\$26	\$322,958	\$0	\$322,958	\$322,958	\$0	\$322,958
10	\$26	\$0	\$26	\$329,417	\$0	\$329,417	\$329,417	\$0	\$329,417
11	\$27	\$0	\$27	\$292,004	\$0	\$292,004	\$292,004	\$0	\$292,004
12	\$27	\$0	\$27	\$171,363	\$0	\$171,363	\$171,363	\$0	\$171,363
13	\$28	\$0	\$28	\$87,395	\$0	\$87,395	\$87,395	\$0	\$87,395
Totals	\$321	\$0	\$321	\$3,109,958	\$0	\$3,109,958	\$3,109,958	\$0	\$3,109,958

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$175,000	\$0	\$175,000	\$599	\$665	\$0	\$0	\$0
2	\$0	\$0	\$175,000	\$0	\$175,000	\$209	\$333	\$0	\$0	\$0
3	\$0	\$0	\$175,000	\$0	\$175,000	\$200	\$222	\$0	\$0	\$0
4	\$0	\$0	\$175,000	\$0	\$175,000	\$160	\$166	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$700,000	\$0	\$700,000	\$1,247	\$1,388	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$40,524	\$13,965	\$0	\$0	\$54,489	\$0	\$0	\$0	\$0
2	\$83,642	\$28,823	\$0	\$0	\$112,465	\$0	\$0	\$0	\$0
3	\$129,478	\$44,618	\$0	\$0	\$174,095	\$0	\$0	\$0	\$0
4	\$178,161	\$61,394	\$0	\$0	\$239,555	\$0	\$0	\$0	\$0
5	\$183,862	\$63,359	\$0	\$0	\$247,221	\$0	\$0	\$0	\$0
6	\$189,746	\$65,386	\$0	\$0	\$255,132	\$0	\$0	\$0	\$0
7	\$195,818	\$67,478	\$0	\$0	\$263,296	\$0	\$0	\$0	\$0
8	\$202,084	\$69,638	\$0	\$0	\$271,722	\$0	\$0	\$0	\$0
9	\$208,551	\$71,866	\$0	\$0	\$280,417	\$0	\$0	\$0	\$0
10	\$215,224	\$74,166	\$0	\$0	\$289,390	\$0	\$0	\$0	\$0
11	\$166,684	\$57,404	\$0	\$0	\$223,888	\$0	\$0	\$0	\$0
12	\$114,610	\$39,494	\$0	\$0	\$154,104	\$0	\$0	\$0	\$0
13	\$59,139	\$20,379	\$0	\$0	\$79,518	\$0	\$0	\$0	\$0
Totals	\$1,967,422	\$677,970	\$0	\$0	\$2,645,392	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$40,524	\$13,965	\$0	\$0	\$54,489	\$0	\$0	\$0	\$0
2	\$83,642	\$28,823	\$0	\$0	\$112,465	\$0	\$0	\$0	\$0
3	\$129,478	\$44,618	\$0	\$0	\$174,095	\$0	\$0	\$0	\$0
4	\$178,161	\$61,394	\$0	\$0	\$239,555	\$0	\$0	\$0	\$0
5	\$183,862	\$63,359	\$0	\$0	\$247,221	\$0	\$0	\$0	\$0
6	\$189,746	\$65,386	\$0	\$0	\$255,132	\$0	\$0	\$0	\$0
7	\$195,818	\$67,478	\$0	\$0	\$263,296	\$0	\$0	\$0	\$0
8	\$202,084	\$69,638	\$0	\$0	\$271,722	\$0	\$0	\$0	\$0
9	\$208,551	\$71,866	\$0	\$0	\$280,417	\$0	\$0	\$0	\$0
10	\$215,224	\$74,166	\$0	\$0	\$289,390	\$0	\$0	\$0	\$0
11	\$166,684	\$57,404	\$0	\$0	\$223,888	\$0	\$0	\$0	\$0
12	\$114,610	\$39,494	\$0	\$0	\$154,104	\$0	\$0	\$0	\$0
13	\$59,139	\$20,379	\$0	\$0	\$79,518	\$0	\$0	\$0	\$0
Totals	\$1,967,422	\$677,970	\$0	\$0	\$2,645,392	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	600	60	600	60	640	640	\$0	\$0	\$0
2	600	60	1200	120	1080	1080	\$0	\$0	\$0
3	600	60	1800	180	1620	1620	\$0	\$0	\$0
4	600	60	2400	240	2160	2160	\$0	\$0	\$0
5	0	0	2400	240	2160	2160	\$0	\$0	\$0
6	0	0	2400	240	2160	2160	\$0	\$0	\$0
7	0	0	2400	240	2160	2160	\$0	\$0	\$0
8	0	0	2400	240	2160	2160	\$0	\$0	\$0
9	0	0	2400	240	2160	2160	\$0	\$0	\$0
10	0	0	2400	240	2160	2160	\$0	\$0	\$0
11	0	0	2400	240	2160	2160	\$0	\$0	\$0
12	0	0	2400	240	2160	2160	\$0	\$0	\$0
13	0	0	2400	240	2160	2160	\$0	\$0	\$0
14	0	0	2400	240	2160	2160	\$0	\$0	\$0
15	0	0	2400	240	2160	2160	\$0	\$0	\$0
16	0	0	1800	180	1620	1620	\$0	\$0	\$0
17	0	0	1200	120	1080	1080	\$0	\$0	\$0
18	0	0	600	60	640	640	\$0	\$0	\$0
Totals	3400	340	36300	3630	32400	32400	\$0	\$0	\$0

Impacts and Savings																												
Year	Electric Impacts/Savings										Gas Impacts/Savings																	
	Per Participant										Per Participant																	
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)							
1	0.06	0.05	0.06	0.05	0.03	0.03	357	322	35	32	15	214,451	193,006	35	32	35	32	17	15	214,451	193,006	0	0	0	0	0	0	
2	0.06	0.05	0.06	0.05	0.03	0.03	357	322	106	95	106	95	106	95	106	95	106	95	106	95	106	95	106	95	106	95	106	95
3	0.06	0.05	0.06	0.05	0.03	0.03	357	322	196	170	196	170	196	170	196	170	196	170	196	170	196	170	196	170	196	170	196	170
4	0.06	0.05	0.06	0.05	0.03	0.03	357	322	286	241	286	241	286	241	286	241	286	241	286	241	286	241	286	241	286	241	286	241
5	0.06	0.05	0.06	0.05	0.03	0.03	357	322	376	311	376	311	376	311	376	311	376	311	376	311	376	311	376	311	376	311	376	311
6	0.06	0.05	0.06	0.05	0.03	0.03	357	322	466	381	466	381	466	381	466	381	466	381	466	381	466	381	466	381	466	381	466	381
7	0.06	0.05	0.06	0.05	0.03	0.03	357	322	556	451	556	451	556	451	556	451	556	451	556	451	556	451	556	451	556	451	556	451
8	0.06	0.05	0.06	0.05	0.03	0.03	357	322	646	521	646	521	646	521	646	521	646	521	646	521	646	521	646	521	646	521	646	521
9	0.06	0.05	0.06	0.05	0.03	0.03	357	322	736	591	736	591	736	591	736	591	736	591	736	591	736	591	736	591	736	591	736	591
10	0.06	0.05	0.06	0.05	0.03	0.03	357	322	826	661	826	661	826	661	826	661	826	661	826	661	826	661	826	661	826	661	826	661
11	0.06	0.05	0.06	0.05	0.03	0.03	357	322	916	731	916	731	916	731	916	731	916	731	916	731	916	731	916	731	916	731	916	731
12	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1006	801	1006	801	1006	801	1006	801	1006	801	1006	801	1006	801	1006	801	1006	801	1006	801
13	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1096	871	1096	871	1096	871	1096	871	1096	871	1096	871	1096	871	1096	871	1096	871	1096	871
14	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1186	941	1186	941	1186	941	1186	941	1186	941	1186	941	1186	941	1186	941	1186	941	1186	941
15	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011	1276	1011
16	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081	1366	1081
17	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151	1456	1151
18	0.06	0.05	0.06	0.05	0.03	0.03	357	322	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221	1546	1221
Totals							6,434	5,790				12,867,037	11,580,333										857,802	772,022	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$27	\$0	\$27	\$14,458	\$0	\$14,458	\$14,458	\$0	\$14,458
2	\$27	\$0	\$27	\$28,916	\$0	\$28,916	\$28,916	\$0	\$28,916
3	\$28	\$0	\$28	\$43,374	\$0	\$43,374	\$43,374	\$0	\$43,374
4	\$28	\$0	\$28	\$61,373	\$0	\$61,373	\$61,373	\$0	\$61,373
5	\$29	\$0	\$29	\$82,600	\$0	\$82,600	\$82,600	\$0	\$82,600
6	\$30	\$0	\$30	\$63,852	\$0	\$63,852	\$63,852	\$0	\$63,852
7	\$30	\$0	\$30	\$65,129	\$0	\$65,129	\$65,129	\$0	\$65,129
8	\$31	\$0	\$31	\$66,432	\$0	\$66,432	\$66,432	\$0	\$66,432
9	\$31	\$0	\$31	\$67,760	\$0	\$67,760	\$67,760	\$0	\$67,760
10	\$32	\$0	\$32	\$69,116	\$0	\$69,116	\$69,116	\$0	\$69,116
11	\$33	\$0	\$33	\$70,498	\$0	\$70,498	\$70,498	\$0	\$70,498
12	\$33	\$0	\$33	\$71,908	\$0	\$71,908	\$71,908	\$0	\$71,908
13	\$34	\$0	\$34	\$73,346	\$0	\$73,346	\$73,346	\$0	\$73,346
14	\$35	\$0	\$35	\$74,813	\$0	\$74,813	\$74,813	\$0	\$74,813
15	\$35	\$0	\$35	\$76,309	\$0	\$76,309	\$76,309	\$0	\$76,309
16	\$36	\$0	\$36	\$58,377	\$0	\$58,377	\$58,377	\$0	\$58,377
17	\$37	\$0	\$37	\$39,696	\$0	\$39,696	\$39,696	\$0	\$39,696
18	\$37	\$0	\$37	\$20,245	\$0	\$20,245	\$20,245	\$0	\$20,245
Totals	\$573	\$0	\$573	\$1,030,534	\$0	\$1,030,534	\$1,030,534	\$0	\$1,030,534

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-kWh	\$/CCF-kWh
1	\$0	\$0	\$30,000	\$0	\$30,000	\$573	\$637	\$0	\$0	\$0
2	\$0	\$0	\$30,000	\$0	\$30,000	\$287	\$319	\$0	\$0	\$0
3	\$0	\$0	\$30,000	\$0	\$30,000	\$191	\$212	\$0	\$0	\$0
4	\$0	\$0	\$30,000	\$0	\$30,000	\$143	\$159	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$120,000	\$0	\$120,000	\$1,196	\$1,327	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capex	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$8,391	\$3,163	\$0	\$0	\$11,554	\$0	\$0	\$0	\$0
2	\$17,318	\$6,529	\$0	\$0	\$23,847	\$0	\$0	\$0	\$0
3	\$26,808	\$10,107	\$0	\$0	\$36,915	\$0	\$0	\$0	\$0
4	\$36,888	\$13,907	\$0	\$0	\$50,796	\$0	\$0	\$0	\$0
5	\$38,069	\$14,352	\$0	\$0	\$52,421	\$0	\$0	\$0	\$0
6	\$39,287	\$14,812	\$0	\$0	\$54,099	\$0	\$0	\$0	\$0
7	\$40,544	\$15,286	\$0	\$0	\$55,830	\$0	\$0	\$0	\$0
8	\$41,841	\$15,775	\$0	\$0	\$57,616	\$0	\$0	\$0	\$0
9	\$43,180	\$16,280	\$0	\$0	\$59,460	\$0	\$0	\$0	\$0
10	\$44,562	\$16,801	\$0	\$0	\$61,363	\$0	\$0	\$0	\$0
11	\$45,988	\$17,338	\$0	\$0	\$63,326	\$0	\$0	\$0	\$0
12	\$47,460	\$17,893	\$0	\$0	\$65,353	\$0	\$0	\$0	\$0
13	\$48,978	\$18,466	\$0	\$0	\$67,444	\$0	\$0	\$0	\$0
14	\$50,546	\$19,057	\$0	\$0	\$69,602	\$0	\$0	\$0	\$0
15	\$52,163	\$19,666	\$0	\$0	\$71,830	\$0	\$0	\$0	\$0
16	\$40,374	\$16,222	\$0	\$0	\$56,596	\$0	\$0	\$0	\$0
17	\$27,778	\$10,473	\$0	\$0	\$38,250	\$0	\$0	\$0	\$0
18	\$14,333	\$5,404	\$0	\$0	\$19,737	\$0	\$0	\$0	\$0
Totals	\$664,609	\$250,531	\$0	\$0	\$915,039	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capex	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$8,391	\$3,163	\$0	\$0	\$11,554	\$0	\$0	\$0	\$0
2	\$17,318	\$6,529	\$0	\$0	\$23,847	\$0	\$0	\$0	\$0
3	\$26,808	\$10,107	\$0	\$0	\$36,915	\$0	\$0	\$0	\$0
4	\$36,888	\$13,907	\$0	\$0	\$50,796	\$0	\$0	\$0	\$0
5	\$38,069	\$14,352	\$0	\$0	\$52,421	\$0	\$0	\$0	\$0
6	\$39,287	\$14,812	\$0	\$0	\$54,099	\$0	\$0	\$0	\$0
7	\$40,544	\$15,286	\$0	\$0	\$55,830	\$0	\$0	\$0	\$0
8	\$41,841	\$15,775	\$0	\$0	\$57,616	\$0	\$0	\$0	\$0
9	\$43,180	\$16,280	\$0	\$0	\$59,460	\$0	\$0	\$0	\$0
10	\$44,562	\$16,801	\$0	\$0	\$61,363	\$0	\$0	\$0	\$0
11	\$45,988	\$17,338	\$0	\$0	\$63,326	\$0	\$0	\$0	\$0
12	\$47,460	\$17,893	\$0	\$0	\$65,353	\$0	\$0	\$0	\$0
13	\$48,978	\$18,466	\$0	\$0	\$67,444	\$0	\$0	\$0	\$0
14	\$50,546	\$19,057	\$0	\$0	\$69,602	\$0	\$0	\$0	\$0
15	\$52,163	\$19,666	\$0	\$0	\$71,830	\$0	\$0	\$0	\$0
16	\$40,374	\$16,222	\$0	\$0	\$56,596	\$0	\$0	\$0	\$0
17	\$27,778	\$10,473	\$0	\$0	\$38,250	\$0	\$0	\$0	\$0
18	\$14,333	\$5,404	\$0	\$0	\$19,737	\$0	\$0	\$0	\$0
Totals	\$664,609	\$250,531	\$0	\$0	\$915,039	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation					Total Participant Costs			
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	One-Time Investment	Annual Investment	Total Costs	
1	50	5	50	5	45	\$60,000	\$0	\$60,000	
2	50	5	100	10	90	\$60,000	\$0	\$60,000	
3	50	5	150	15	135	\$60,000	\$0	\$60,000	
4	50	5	200	20	180	\$60,000	\$0	\$60,000	
5	0	0	200	20	180	\$0	\$0	\$0	
6	0	0	200	20	180	\$0	\$0	\$0	
7	0	0	200	20	180	\$0	\$0	\$0	
8	0	0	200	20	180	\$0	\$0	\$0	
9	0	0	200	20	180	\$0	\$0	\$0	
10	0	0	200	20	180	\$0	\$0	\$0	
11	0	0	200	20	180	\$0	\$0	\$0	
12	0	0	200	20	180	\$0	\$0	\$0	
13	0	0	200	20	180	\$0	\$0	\$0	
14	0	0	200	20	180	\$0	\$0	\$0	
15	0	0	200	20	180	\$0	\$0	\$0	
16	0	0	150	15	135	\$0	\$0	\$0	
17	0	0	100	10	90	\$0	\$0	\$0	
18	0	0	50	5	45	\$0	\$0	\$0	
Totals	200	20	3000	300	2700	\$240,000	\$0	\$240,000	

Impacts and Savings	Electric Impacts/Savings																Gas Impacts/Savings													
Year	Per Participant										Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant							
	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	WBH	WBH (est)	kW	kWh (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	WBH	WBH (est)	LW (est)	Summer Con (kW)	Summer Con (kWh)	Winter Con (kW)	Winter Con (kWh)	WBH	WBH (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	CO2 (est)	
1	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	18	16	14	12	21	19	126,957	114,262	18	16	14	12	21	19	126,957	114,262	0	0	0	0	0	
2	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	36	33	28	25	42	38	253,915	228,523	18	16	14	12	21	19	126,957	114,262	0	0	0	0	0	
3	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	54	49	41	37	64	57	380,872	342,765	18	16	14	12	21	19	126,957	114,262	0	0	0	0	0	
4	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	18	16	14	12	21	19	126,957	114,262	0	0	0	0	0	
5	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	73	65	55	50	85	76	507,829	457,046	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	54	49	41	37	64	57	380,872	342,765	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	36	33	28	25	42	38	253,915	228,523	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0.36	0.33	0.28	0.25	0.42	0.38	2,539	2,285	18	16	14	12	21	19	126,957	114,262	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals										45,705	41,134					7,617,439	6,855,695							507,829	457,046	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$190	\$0	\$190	\$8,559	\$0	\$8,559	\$8,559	\$0	\$8,559
2	\$194	\$0	\$194	\$17,461	\$0	\$17,461	\$17,461	\$0	\$17,461
3	\$198	\$0	\$198	\$26,716	\$0	\$26,716	\$26,716	\$0	\$26,716
4	\$202	\$0	\$202	\$36,333	\$0	\$36,333	\$36,333	\$0	\$36,333
5	\$206	\$0	\$206	\$37,060	\$0	\$37,060	\$37,060	\$0	\$37,060
6	\$210	\$0	\$210	\$37,801	\$0	\$37,801	\$37,801	\$0	\$37,801
7	\$214	\$0	\$214	\$38,557	\$0	\$38,557	\$38,557	\$0	\$38,557
8	\$218	\$0	\$218	\$39,328	\$0	\$39,328	\$39,328	\$0	\$39,328
9	\$223	\$0	\$223	\$40,115	\$0	\$40,115	\$40,115	\$0	\$40,115
10	\$227	\$0	\$227	\$40,917	\$0	\$40,917	\$40,917	\$0	\$40,917
11	\$232	\$0	\$232	\$41,736	\$0	\$41,736	\$41,736	\$0	\$41,736
12	\$237	\$0	\$237	\$42,570	\$0	\$42,570	\$42,570	\$0	\$42,570
13	\$241	\$0	\$241	\$43,422	\$0	\$43,422	\$43,422	\$0	\$43,422
14	\$246	\$0	\$246	\$44,290	\$0	\$44,290	\$44,290	\$0	\$44,290
15	\$251	\$0	\$251	\$45,176	\$0	\$45,176	\$45,176	\$0	\$45,176
16	\$256	\$0	\$256	\$34,560	\$0	\$34,560	\$34,560	\$0	\$34,560
17	\$261	\$0	\$261	\$23,501	\$0	\$23,501	\$23,501	\$0	\$23,501
18	\$266	\$0	\$266	\$11,985	\$0	\$11,985	\$11,985	\$0	\$11,985
Totals	\$4,073	\$0	\$4,073	\$610,089	\$0	\$610,089	\$610,089	\$0	\$610,089

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$15,000	\$0	\$15,000	\$429	\$478	\$0	\$0	\$0
2	\$0	\$0	\$15,000	\$0	\$15,000	\$274	\$298	\$0	\$0	\$0
3	\$0	\$0	\$15,000	\$0	\$15,000	\$143	\$159	\$0	\$0	\$0
4	\$0	\$0	\$15,000	\$0	\$15,000	\$107	\$119	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$60,000	\$0	\$60,000	\$893	\$992	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$4,630	\$1,239	\$0	\$0	\$5,869	\$0	\$0	\$0	\$0
2	\$9,556	\$2,557	\$0	\$0	\$12,113	\$0	\$0	\$0	\$0
3	\$14,752	\$3,956	\$0	\$0	\$18,750	\$0	\$0	\$0	\$0
4	\$20,354	\$5,446	\$0	\$0	\$25,801	\$0	\$0	\$0	\$0
5	\$21,006	\$5,621	\$0	\$0	\$26,626	\$0	\$0	\$0	\$0
6	\$21,678	\$5,800	\$0	\$0	\$27,478	\$0	\$0	\$0	\$0
7	\$22,371	\$5,986	\$0	\$0	\$28,358	\$0	\$0	\$0	\$0
8	\$23,087	\$6,178	\$0	\$0	\$29,265	\$0	\$0	\$0	\$0
9	\$23,826	\$6,375	\$0	\$0	\$30,201	\$0	\$0	\$0	\$0
10	\$24,589	\$6,579	\$0	\$0	\$31,168	\$0	\$0	\$0	\$0
11	\$25,375	\$6,790	\$0	\$0	\$32,165	\$0	\$0	\$0	\$0
12	\$26,187	\$7,007	\$0	\$0	\$33,195	\$0	\$0	\$0	\$0
13	\$27,025	\$7,231	\$0	\$0	\$34,257	\$0	\$0	\$0	\$0
14	\$27,890	\$7,463	\$0	\$0	\$35,353	\$0	\$0	\$0	\$0
15	\$28,783	\$7,702	\$0	\$0	\$36,484	\$0	\$0	\$0	\$0
16	\$29,718	\$7,951	\$0	\$0	\$37,669	\$0	\$0	\$0	\$0
17	\$30,697	\$8,210	\$0	\$0	\$38,907	\$0	\$0	\$0	\$0
18	\$31,716	\$8,480	\$0	\$0	\$40,196	\$0	\$0	\$0	\$0
Totals	\$366,665	\$98,110	\$0	\$0	\$464,775	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$4,630	\$1,239	\$0	\$0	\$5,869	\$0	\$0	\$0	\$0
2	\$9,556	\$2,557	\$0	\$0	\$12,113	\$0	\$0	\$0	\$0
3	\$14,752	\$3,956	\$0	\$0	\$18,750	\$0	\$0	\$0	\$0
4	\$20,354	\$5,446	\$0	\$0	\$25,801	\$0	\$0	\$0	\$0
5	\$21,006	\$5,621	\$0	\$0	\$26,626	\$0	\$0	\$0	\$0
6	\$21,678	\$5,800	\$0	\$0	\$27,478	\$0	\$0	\$0	\$0
7	\$22,371	\$5,986	\$0	\$0	\$28,358	\$0	\$0	\$0	\$0
8	\$23,087	\$6,178	\$0	\$0	\$29,265	\$0	\$0	\$0	\$0
9	\$23,826	\$6,375	\$0	\$0	\$30,201	\$0	\$0	\$0	\$0
10	\$24,589	\$6,579	\$0	\$0	\$31,168	\$0	\$0	\$0	\$0
11	\$25,375	\$6,790	\$0	\$0	\$32,165	\$0	\$0	\$0	\$0
12	\$26,187	\$7,007	\$0	\$0	\$33,195	\$0	\$0	\$0	\$0
13	\$27,025	\$7,231	\$0	\$0	\$34,257	\$0	\$0	\$0	\$0
14	\$27,890	\$7,463	\$0	\$0	\$35,353	\$0	\$0	\$0	\$0
15	\$28,783	\$7,702	\$0	\$0	\$36,484	\$0	\$0	\$0	\$0
16	\$29,718	\$7,951	\$0	\$0	\$37,669	\$0	\$0	\$0	\$0
17	\$30,697	\$8,210	\$0	\$0	\$38,907	\$0	\$0	\$0	\$0
18	\$31,716	\$8,480	\$0	\$0	\$40,196	\$0	\$0	\$0	\$0
Totals	\$366,665	\$98,110	\$0	\$0	\$464,775	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$97,485	\$447,250	\$550,000	\$41,902	\$1,136,637	\$1,209	\$1,343	\$0	\$0	\$0
2	\$100,897	\$447,250	\$550,000	\$27,440	\$1,125,587	\$098	\$665	\$0	\$0	\$0
3	\$104,429	\$447,250	\$550,000	\$27,989	\$1,129,668	\$400	\$445	\$0	\$0	\$0
4	\$108,084	\$447,250	\$550,000	\$43,049	\$1,148,383	\$305	\$399	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$410,885	\$1,788,000	\$2,200,000	\$140,880	\$4,540,775	\$2,513	\$2,792	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$155,395	\$56,829	\$0	\$0	\$212,224	\$0	\$0	\$0	\$0	\$0
2	\$320,736	\$117,294	\$0	\$0	\$438,030	\$0	\$0	\$0	\$0	\$0
3	\$486,499	\$181,572	\$0	\$0	\$668,071	\$0	\$0	\$0	\$0	\$0
4	\$683,183	\$249,843	\$0	\$0	\$933,026	\$0	\$0	\$0	\$0	\$0
5	\$705,045	\$257,838	\$0	\$0	\$962,883	\$0	\$0	\$0	\$0	\$0
6	\$727,606	\$266,088	\$0	\$0	\$993,695	\$0	\$0	\$0	\$0	\$0
7	\$750,890	\$274,603	\$0	\$0	\$1,025,493	\$0	\$0	\$0	\$0	\$0
8	\$774,918	\$283,391	\$0	\$0	\$1,058,309	\$0	\$0	\$0	\$0	\$0
9	\$799,716	\$292,459	\$0	\$0	\$1,092,175	\$0	\$0	\$0	\$0	\$0
10	\$825,307	\$301,818	\$0	\$0	\$1,127,124	\$0	\$0	\$0	\$0	\$0
11	\$851,716	\$311,478	\$0	\$0	\$1,163,192	\$0	\$0	\$0	\$0	\$0
12	\$878,971	\$321,443	\$0	\$0	\$1,200,414	\$0	\$0	\$0	\$0	\$0
13	\$907,098	\$331,729	\$0	\$0	\$1,238,828	\$0	\$0	\$0	\$0	\$0
14	\$936,126	\$342,345	\$0	\$0	\$1,278,470	\$0	\$0	\$0	\$0	\$0
15	\$966,082	\$353,300	\$0	\$0	\$1,319,381	\$0	\$0	\$0	\$0	\$0
16	\$747,747	\$273,454	\$0	\$0	\$1,021,201	\$0	\$0	\$0	\$0	\$0
17	\$514,450	\$188,136	\$0	\$0	\$702,586	\$0	\$0	\$0	\$0	\$0
18	\$265,456	\$97,078	\$0	\$0	\$362,535	\$0	\$0	\$0	\$0	\$0
Totals	\$12,306,842	\$4,600,696	\$0	\$0	\$16,807,638	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Gas Distribution	Gas Fuel
1	\$155,395	\$56,829	\$0	\$0	\$212,224	\$0	\$0	\$0	\$0	\$0
2	\$320,736	\$117,294	\$0	\$0	\$438,030	\$0	\$0	\$0	\$0	\$0
3	\$486,499	\$181,572	\$0	\$0	\$668,071	\$0	\$0	\$0	\$0	\$0
4	\$683,183	\$249,843	\$0	\$0	\$933,026	\$0	\$0	\$0	\$0	\$0
5	\$705,045	\$257,838	\$0	\$0	\$962,883	\$0	\$0	\$0	\$0	\$0
6	\$727,606	\$266,088	\$0	\$0	\$993,695	\$0	\$0	\$0	\$0	\$0
7	\$750,890	\$274,603	\$0	\$0	\$1,025,493	\$0	\$0	\$0	\$0	\$0
8	\$774,918	\$283,391	\$0	\$0	\$1,058,309	\$0	\$0	\$0	\$0	\$0
9	\$799,716	\$292,459	\$0	\$0	\$1,092,175	\$0	\$0	\$0	\$0	\$0
10	\$825,307	\$301,818	\$0	\$0	\$1,127,124	\$0	\$0	\$0	\$0	\$0
11	\$851,716	\$311,478	\$0	\$0	\$1,163,192	\$0	\$0	\$0	\$0	\$0
12	\$878,971	\$321,443	\$0	\$0	\$1,200,414	\$0	\$0	\$0	\$0	\$0
13	\$907,098	\$331,729	\$0	\$0	\$1,238,828	\$0	\$0	\$0	\$0	\$0
14	\$936,126	\$342,345	\$0	\$0	\$1,278,470	\$0	\$0	\$0	\$0	\$0
15	\$966,082	\$353,300	\$0	\$0	\$1,319,381	\$0	\$0	\$0	\$0	\$0
16	\$747,747	\$273,454	\$0	\$0	\$1,021,201	\$0	\$0	\$0	\$0	\$0
17	\$514,450	\$188,136	\$0	\$0	\$702,586	\$0	\$0	\$0	\$0	\$0
18	\$265,456	\$97,078	\$0	\$0	\$362,535	\$0	\$0	\$0	\$0	\$0
Totals	\$12,306,842	\$4,600,696	\$0	\$0	\$16,807,638	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-kWh	\$/CCF-kWh
1	\$0	\$0	\$100,000	\$0	\$100,000	\$348	\$367	\$0	\$0	\$0
2	\$0	\$0	\$100,000	\$0	\$100,000	\$174	\$183	\$0	\$0	\$0
3	\$0	\$0	\$100,000	\$0	\$100,000	\$118	\$122	\$0	\$0	\$0
4	\$0	\$0	\$100,000	\$0	\$100,000	\$87	\$92	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$400,000	\$0	\$400,000	\$726	\$764	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$31,712	\$27,251	\$0	\$0	\$58,963	\$0	\$0	\$0	\$0
2	\$65,453	\$56,247	\$0	\$0	\$121,700	\$0	\$0	\$0	\$0
3	\$101,221	\$87,070	\$0	\$0	\$188,291	\$0	\$0	\$0	\$0
4	\$139,418	\$119,809	\$0	\$0	\$259,227	\$0	\$0	\$0	\$0
5	\$143,879	\$123,642	\$0	\$0	\$267,522	\$0	\$0	\$0	\$0
6	\$148,484	\$127,599	\$0	\$0	\$276,083	\$0	\$0	\$0	\$0
7	\$153,235	\$131,682	\$0	\$0	\$284,917	\$0	\$0	\$0	\$0
8	\$158,139	\$135,896	\$0	\$0	\$294,035	\$0	\$0	\$0	\$0
9	\$163,199	\$140,245	\$0	\$0	\$303,444	\$0	\$0	\$0	\$0
10	\$168,421	\$144,732	\$0	\$0	\$313,154	\$0	\$0	\$0	\$0
11	\$173,811	\$149,364	\$0	\$0	\$323,175	\$0	\$0	\$0	\$0
12	\$179,373	\$154,144	\$0	\$0	\$333,516	\$0	\$0	\$0	\$0
13	\$185,113	\$159,076	\$0	\$0	\$344,189	\$0	\$0	\$0	\$0
14	\$191,036	\$164,167	\$0	\$0	\$355,203	\$0	\$0	\$0	\$0
15	\$197,150	\$169,420	\$0	\$0	\$366,569	\$0	\$0	\$0	\$0
16	\$192,594	\$164,131	\$0	\$0	\$356,725	\$0	\$0	\$0	\$0
17	\$104,984	\$90,218	\$0	\$0	\$195,203	\$0	\$0	\$0	\$0
18	\$54,172	\$46,553	\$0	\$0	\$100,725	\$0	\$0	\$0	\$0
Totals	\$2,511,494	\$2,158,246	\$0	\$0	\$4,669,739	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$31,712	\$27,251	\$0	\$0	\$58,963	\$0	\$0	\$0	\$0
2	\$65,453	\$56,247	\$0	\$0	\$121,700	\$0	\$0	\$0	\$0
3	\$101,221	\$87,070	\$0	\$0	\$188,291	\$0	\$0	\$0	\$0
4	\$139,418	\$119,809	\$0	\$0	\$259,227	\$0	\$0	\$0	\$0
5	\$143,879	\$123,642	\$0	\$0	\$267,522	\$0	\$0	\$0	\$0
6	\$148,484	\$127,599	\$0	\$0	\$276,083	\$0	\$0	\$0	\$0
7	\$153,235	\$131,682	\$0	\$0	\$284,917	\$0	\$0	\$0	\$0
8	\$158,139	\$135,896	\$0	\$0	\$294,035	\$0	\$0	\$0	\$0
9	\$163,199	\$140,245	\$0	\$0	\$303,444	\$0	\$0	\$0	\$0
10	\$168,421	\$144,732	\$0	\$0	\$313,154	\$0	\$0	\$0	\$0
11	\$173,811	\$149,364	\$0	\$0	\$323,175	\$0	\$0	\$0	\$0
12	\$179,373	\$154,144	\$0	\$0	\$333,516	\$0	\$0	\$0	\$0
13	\$185,113	\$159,076	\$0	\$0	\$344,189	\$0	\$0	\$0	\$0
14	\$191,036	\$164,167	\$0	\$0	\$355,203	\$0	\$0	\$0	\$0
15	\$197,150	\$169,420	\$0	\$0	\$366,569	\$0	\$0	\$0	\$0
16	\$192,594	\$164,131	\$0	\$0	\$356,725	\$0	\$0	\$0	\$0
17	\$104,984	\$90,218	\$0	\$0	\$195,203	\$0	\$0	\$0	\$0
18	\$54,172	\$46,553	\$0	\$0	\$100,725	\$0	\$0	\$0	\$0
Totals	\$2,511,494	\$2,158,246	\$0	\$0	\$4,669,739	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation					Total Participant Costs			
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$560,000	\$0	\$560,000
2	700	140	1400	280	1120	1120	\$560,000	\$0	\$560,000
3	700	140	2100	420	1680	1680	\$560,000	\$0	\$560,000
4	700	140	2800	560	2240	2240	\$560,000	\$0	\$560,000
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	2800	560	42000	8400	33600	33600	\$2,340,000	\$0	\$2,340,000

Impacts and Savings																											
Year	Per Participant										Electric Impacts/Savings										Gas Impacts/Savings						
	kW (net)		Summer Con (kW)		Winter Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		Wttr Con (kW)		
	kW (net)	Wttr Con (kW)	Summer Con (kW)	Winter Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	Wttr Con (kW)	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals																											

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Fuel	Net Fuel	Net Fuel
1	\$132	\$0	\$132	\$73,783	\$0	\$73,783	\$73,783	\$0	\$73,783
2	\$134	\$0	\$134	\$150,516	\$0	\$150,516	\$150,516	\$0	\$150,516
3	\$137	\$0	\$137	\$230,290	\$0	\$230,290	\$230,290	\$0	\$230,290
4	\$140	\$0	\$140	\$313,195	\$0	\$313,195	\$313,195	\$0	\$313,195
5	\$143	\$0	\$143	\$319,458	\$0	\$319,458	\$319,458	\$0	\$319,458
6	\$145	\$0	\$145	\$325,648	\$0	\$325,648	\$325,648	\$0	\$325,648
7	\$148	\$0	\$148	\$332,365	\$0	\$332,365	\$332,365	\$0	\$332,365
8	\$151	\$0	\$151	\$339,012	\$0	\$339,012	\$339,012	\$0	\$339,012
9	\$154	\$0	\$154	\$345,792	\$0	\$345,792	\$345,792	\$0	\$345,792
10	\$157	\$0	\$157	\$352,708	\$0	\$352,708	\$352,708	\$0	\$352,708
11	\$161	\$0	\$161	\$359,762	\$0	\$359,762	\$359,762	\$0	\$359,762
12	\$164	\$0	\$164	\$366,957	\$0	\$366,957	\$366,957	\$0	\$366,957
13	\$167	\$0	\$167	\$374,296	\$0	\$374,296	\$374,296	\$0	\$374,296
14	\$170	\$0	\$170	\$381,782	\$0	\$381,782	\$381,782	\$0	\$381,782
15	\$174	\$0	\$174	\$389,418	\$0	\$389,418	\$389,418	\$0	\$389,418
16	\$177	\$0	\$177	\$397,605	\$0	\$397,605	\$397,605	\$0	\$397,605
17	\$181	\$0	\$181	\$202,575	\$0	\$202,575	\$202,575	\$0	\$202,575
18	\$184	\$0	\$184	\$103,313	\$0	\$103,313	\$103,313	\$0	\$103,313
Totals	\$2,821	\$0	\$2,821	\$5,258,976	\$0	\$5,258,976	\$5,258,976	\$0	\$5,258,976

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$280,000	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Contingency	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$87,574	\$0	\$0	\$0	\$87,574	\$0	\$0	\$0	\$0
2	\$180,753	\$0	\$0	\$0	\$180,753	\$0	\$0	\$0	\$0
3	\$279,805	\$0	\$0	\$0	\$279,805	\$0	\$0	\$0	\$0
4	\$385,012	\$0	\$0	\$0	\$385,012	\$0	\$0	\$0	\$0
5	\$397,333	\$0	\$0	\$0	\$397,333	\$0	\$0	\$0	\$0
6	\$410,047	\$0	\$0	\$0	\$410,047	\$0	\$0	\$0	\$0
7	\$423,169	\$0	\$0	\$0	\$423,169	\$0	\$0	\$0	\$0
8	\$436,710	\$0	\$0	\$0	\$436,710	\$0	\$0	\$0	\$0
9	\$450,685	\$0	\$0	\$0	\$450,685	\$0	\$0	\$0	\$0
10	\$465,107	\$0	\$0	\$0	\$465,107	\$0	\$0	\$0	\$0
11	\$479,990	\$0	\$0	\$0	\$479,990	\$0	\$0	\$0	\$0
12	\$495,350	\$0	\$0	\$0	\$495,350	\$0	\$0	\$0	\$0
13	\$511,201	\$0	\$0	\$0	\$511,201	\$0	\$0	\$0	\$0
14	\$527,560	\$0	\$0	\$0	\$527,560	\$0	\$0	\$0	\$0
15	\$544,441	\$0	\$0	\$0	\$544,441	\$0	\$0	\$0	\$0
16	\$421,398	\$0	\$0	\$0	\$421,398	\$0	\$0	\$0	\$0
17	\$289,922	\$0	\$0	\$0	\$289,922	\$0	\$0	\$0	\$0
18	\$149,600	\$0	\$0	\$0	\$149,600	\$0	\$0	\$0	\$0
Totals	\$6,935,656	\$0	\$0	\$0	\$6,935,656	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$87,574	\$0	\$0	\$0	\$87,574	\$0	\$0	\$0	\$0
2	\$180,753	\$0	\$0	\$0	\$180,753	\$0	\$0	\$0	\$0
3	\$279,805	\$0	\$0	\$0	\$279,805	\$0	\$0	\$0	\$0
4	\$385,012	\$0	\$0	\$0	\$385,012	\$0	\$0	\$0	\$0
5	\$397,333	\$0	\$0	\$0	\$397,333	\$0	\$0	\$0	\$0
6	\$410,047	\$0	\$0	\$0	\$410,047	\$0	\$0	\$0	\$0
7	\$423,169	\$0	\$0	\$0	\$423,169	\$0	\$0	\$0	\$0
8	\$436,710	\$0	\$0	\$0	\$436,710	\$0	\$0	\$0	\$0
9	\$450,685	\$0	\$0	\$0	\$450,685	\$0	\$0	\$0	\$0
10	\$465,107	\$0	\$0	\$0	\$465,107	\$0	\$0	\$0	\$0
11	\$479,990	\$0	\$0	\$0	\$479,990	\$0	\$0	\$0	\$0
12	\$495,350	\$0	\$0	\$0	\$495,350	\$0	\$0	\$0	\$0
13	\$511,201	\$0	\$0	\$0	\$511,201	\$0	\$0	\$0	\$0
14	\$527,560	\$0	\$0	\$0	\$527,560	\$0	\$0	\$0	\$0
15	\$544,441	\$0	\$0	\$0	\$544,441	\$0	\$0	\$0	\$0
16	\$421,398	\$0	\$0	\$0	\$421,398	\$0	\$0	\$0	\$0
17	\$289,922	\$0	\$0	\$0	\$289,922	\$0	\$0	\$0	\$0
18	\$149,600	\$0	\$0	\$0	\$149,600	\$0	\$0	\$0	\$0
Totals	\$6,935,656	\$0	\$0	\$0	\$6,935,656	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation				Total Participant Costs				
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$490,000	\$0	\$490,000
2	700	140	1400	280	1120	1120	\$490,000	\$0	\$490,000
3	700	140	2100	420	1680	1680	\$490,000	\$0	\$490,000
4	700	140	2800	560	2240	2240	\$490,000	\$0	\$490,000
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	3800	860	42000	8400	33600	33600	\$1,960,000	\$0	\$1,960,000

Impacts and Savings																														
Year	Electric Impacts/Savings												Gas Impacts/Savings																	
	Cumulative												Yearly Incremental (Per Participant * Incremental Participants)						Per Participant											
	Per Participant												Per Participant						Cumulative						Yearly Incremental					
	kW	kWh (est)	Summer Con kW	Summer Con (est)	Winter Con kW	Winter Con (est)	kWh	kWh (est)	kW	kWh (est)	Summer Con kW	Summer Con (est)	Winter Con kW	Winter Con (est)	kWh	kWh (est)	kW	kWh (est)	Summer Con kW	Summer Con (est)	Winter Con kW	Winter Con (est)	kWh	kWh (est)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)	CO ₂	CO ₂ (est)
2	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	1,844,821	1,475,857	0	0	0	0	0	0	1,844,821	1,475,857	0	0	0	0	0	0
3	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	3,689,643	2,951,714	0	0	0	0	0	0	3,689,643	2,951,714	0	0	0	0	0	0
4	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	5,334,464	4,427,571	0	0	0	0	0	0	5,334,464	4,427,571	0	0	0	0	0	0
5	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
6	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
7	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
8	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
9	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
10	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
11	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
12	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
13	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
14	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
15	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0	7,379,286	5,903,429	0	0	0	0	0	0
16	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	5,334,464	4,427,571	0	0	0	0	0	0	5,334,464	4,427,571	0	0	0	0	0	0
17	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	3,689,643	2,951,714	0	0	0	0	0	0	3,689,643	2,951,714	0	0	0	0	0	0
18	0	0	0	0	0	0	2,635	2,108	0	0	0	0	0	0	1,844,821	1,475,857	0	0	0	0	0	0	1,844,821	1,475,857	0	0	0	0	0	0
Totals							47,438	37,951						110,689,286	88,551,429							7,379,286	5,903,429	0	0	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$186	\$0	\$186	\$104,223	\$0	\$104,223	\$104,223	\$0	\$104,223
2	\$190	\$0	\$190	\$212,615	\$0	\$212,615	\$212,615	\$0	\$212,615
3	\$194	\$0	\$194	\$325,301	\$0	\$325,301	\$325,301	\$0	\$325,301
4	\$198	\$0	\$198	\$442,409	\$0	\$442,409	\$442,409	\$0	\$442,409
5	\$201	\$0	\$201	\$451,257	\$0	\$451,257	\$451,257	\$0	\$451,257
6	\$205	\$0	\$205	\$460,282	\$0	\$460,282	\$460,282	\$0	\$460,282
7	\$210	\$0	\$210	\$469,488	\$0	\$469,488	\$469,488	\$0	\$469,488
8	\$214	\$0	\$214	\$478,877	\$0	\$478,877	\$478,877	\$0	\$478,877
9	\$218	\$0	\$218	\$488,455	\$0	\$488,455	\$488,455	\$0	\$488,455
10	\$222	\$0	\$222	\$498,224	\$0	\$498,224	\$498,224	\$0	\$498,224
11	\$227	\$0	\$227	\$508,189	\$0	\$508,189	\$508,189	\$0	\$508,189
12	\$231	\$0	\$231	\$518,352	\$0	\$518,352	\$518,352	\$0	\$518,352
13	\$236	\$0	\$236	\$528,719	\$0	\$528,719	\$528,719	\$0	\$528,719
14	\$241	\$0	\$241	\$539,294	\$0	\$539,294	\$539,294	\$0	\$539,294
15	\$246	\$0	\$246	\$550,080	\$0	\$550,080	\$550,080	\$0	\$550,080
16	\$250	\$0	\$250	\$420,811	\$0	\$420,811	\$420,811	\$0	\$420,811
17	\$255	\$0	\$255	\$286,151	\$0	\$286,151	\$286,151	\$0	\$286,151
18	\$261	\$0	\$261	\$145,937	\$0	\$145,937	\$145,937	\$0	\$145,937
Totals	\$3,985	\$0	\$3,985	\$7,428,663	\$0	\$7,428,663	\$7,428,663	\$0	\$7,428,663

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$70,000	\$0	\$70,000	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$280,000	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Contingency	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$78,914	\$0	\$0	\$0	\$78,914	\$0	\$0	\$0	\$0
2	\$162,878	\$0	\$0	\$0	\$162,878	\$0	\$0	\$0	\$0
3	\$252,135	\$0	\$0	\$0	\$252,135	\$0	\$0	\$0	\$0
4	\$348,038	\$0	\$0	\$0	\$348,038	\$0	\$0	\$0	\$0
5	\$358,040	\$0	\$0	\$0	\$358,040	\$0	\$0	\$0	\$0
6	\$369,497	\$0	\$0	\$0	\$369,497	\$0	\$0	\$0	\$0
7	\$381,321	\$0	\$0	\$0	\$381,321	\$0	\$0	\$0	\$0
8	\$393,523	\$0	\$0	\$0	\$393,523	\$0	\$0	\$0	\$0
9	\$406,116	\$0	\$0	\$0	\$406,116	\$0	\$0	\$0	\$0
10	\$419,112	\$0	\$0	\$0	\$419,112	\$0	\$0	\$0	\$0
11	\$432,523	\$0	\$0	\$0	\$432,523	\$0	\$0	\$0	\$0
12	\$446,364	\$0	\$0	\$0	\$446,364	\$0	\$0	\$0	\$0
13	\$460,648	\$0	\$0	\$0	\$460,648	\$0	\$0	\$0	\$0
14	\$475,388	\$0	\$0	\$0	\$475,388	\$0	\$0	\$0	\$0
15	\$490,601	\$0	\$0	\$0	\$490,601	\$0	\$0	\$0	\$0
16	\$379,725	\$0	\$0	\$0	\$379,725	\$0	\$0	\$0	\$0
17	\$261,251	\$0	\$0	\$0	\$261,251	\$0	\$0	\$0	\$0
18	\$134,805	\$0	\$0	\$0	\$134,805	\$0	\$0	\$0	\$0
Totals	\$6,249,778	\$0	\$0	\$0	\$6,249,778	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$78,914	\$0	\$0	\$0	\$78,914	\$0	\$0	\$0	\$0
2	\$162,878	\$0	\$0	\$0	\$162,878	\$0	\$0	\$0	\$0
3	\$252,135	\$0	\$0	\$0	\$252,135	\$0	\$0	\$0	\$0
4	\$348,038	\$0	\$0	\$0	\$348,038	\$0	\$0	\$0	\$0
5	\$358,040	\$0	\$0	\$0	\$358,040	\$0	\$0	\$0	\$0
6	\$369,497	\$0	\$0	\$0	\$369,497	\$0	\$0	\$0	\$0
7	\$381,321	\$0	\$0	\$0	\$381,321	\$0	\$0	\$0	\$0
8	\$393,523	\$0	\$0	\$0	\$393,523	\$0	\$0	\$0	\$0
9	\$406,116	\$0	\$0	\$0	\$406,116	\$0	\$0	\$0	\$0
10	\$419,112	\$0	\$0	\$0	\$419,112	\$0	\$0	\$0	\$0
11	\$432,523	\$0	\$0	\$0	\$432,523	\$0	\$0	\$0	\$0
12	\$446,364	\$0	\$0	\$0	\$446,364	\$0	\$0	\$0	\$0
13	\$460,648	\$0	\$0	\$0	\$460,648	\$0	\$0	\$0	\$0
14	\$475,388	\$0	\$0	\$0	\$475,388	\$0	\$0	\$0	\$0
15	\$490,601	\$0	\$0	\$0	\$490,601	\$0	\$0	\$0	\$0
16	\$379,725	\$0	\$0	\$0	\$379,725	\$0	\$0	\$0	\$0
17	\$261,251	\$0	\$0	\$0	\$261,251	\$0	\$0	\$0	\$0
18	\$134,805	\$0	\$0	\$0	\$134,805	\$0	\$0	\$0	\$0
Totals	\$6,249,778	\$0	\$0	\$0	\$6,249,778	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Participants (w/ free riders)	Participants (w/ no free riders)	One-Time Investment	Annual Investment	Total Costs
1	5500	550	5500	550	4950	550	\$1,100,000	\$0	\$1,100,000
2	5500	550	11000	1100	9900	9900	\$1,100,000	\$0	\$1,100,000
3	5500	550	16500	1650	14850	14850	\$1,100,000	\$0	\$1,100,000
4	5500	550	22000	2200	19800	19800	\$1,100,000	\$0	\$1,100,000
5	0	0	22000	2200	19800	19800	\$0	\$0	\$0
6	0	0	22000	2200	19800	19800	\$0	\$0	\$0
7	0	0	22000	2200	19800	19800	\$0	\$0	\$0
8	0	0	22000	2200	19800	19800	\$0	\$0	\$0
9	0	0	22000	2200	19800	19800	\$0	\$0	\$0
10	0	0	22000	2200	19800	19800	\$0	\$0	\$0
11	0	0	22000	2200	19800	19800	\$0	\$0	\$0
12	0	0	22000	2200	19800	19800	\$0	\$0	\$0
13	0	0	22000	2200	19800	19800	\$0	\$0	\$0
14	0	0	22000	2200	19800	19800	\$0	\$0	\$0
15	0	0	16500	1650	14850	14850	\$0	\$0	\$0
16	0	0	11000	1100	9900	9900	\$0	\$0	\$0
17	0	0	5500	550	4950	4950	\$0	\$0	\$0
Totals	22000	2200	308000	30800	277200	277200	\$4,400,000	\$0	\$4,400,000

Impacts and Savings																														
Year	Electric Impacts/Savings										Gas Impacts/Savings																			
	Per Participant										Per Participant																			
	kW	kWh (net)	Summer Con kW	Summer Con kWh (net)	Winter Con kW	Winter Con kWh (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)	kW	kWh (net)	Summer Con kW	Summer Con kWh (net)	Winter Con kW	Winter Con kWh (net)	CO2 (net)	CO2 (net)	CO2 (net)	CO2 (net)										
1	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	1,825	1,642	1,186	1,067	1,425	1,283	8,936,359	8,042,705	912	821	593	534	713	641	4,468,170	4,021,353	0	0	0	0
2	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	2,737	2,464	1,779	1,601	2,138	1,924	13,404,509	12,064,058	912	821	593	534	713	641	4,468,170	4,021,353	0	0	0	0
3	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	912	821	593	534	713	641	4,468,170	4,021,353	0	0	0	0
4	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
5	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
6	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
7	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
8	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
9	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
11	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
12	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	3,650	3,285	2,372	2,135	2,850	2,565	17,872,678	16,085,411	0	0	0	0	0	0	0	0	0	0	0	0
13	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	2,737	2,464	1,779	1,601	2,138	1,924	13,404,509	12,064,058	0	0	0	0	0	0	0	0	0	0	0	0
14	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	1,825	1,642	1,186	1,067	1,425	1,283	8,936,359	8,042,705	0	0	0	0	0	0	0	0	0	0	0	0
15	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	912	821	593	534	713	641	4,468,170	4,021,353	0	0	0	0	0	0	0	0	0	0	0	0
16	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0.17	0.15	0.11	0.10	0.13	0.12	812	731	812	731	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals							13,811	12,430									250,217,497	225,195,747							17,872,678	16,085,411	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Total	Net Fuel Electric	Net Fuel Gas	Total
1	\$57	\$0	\$57	\$283,982	\$0	\$283,982	\$283,982	\$0	\$283,982
2	\$59	\$0	\$59	\$579,324	\$0	\$579,324	\$579,324	\$0	\$579,324
3	\$60	\$0	\$60	\$866,365	\$0	\$866,365	\$866,365	\$0	\$866,365
4	\$61	\$0	\$61	\$1,205,456	\$0	\$1,205,456	\$1,205,456	\$0	\$1,205,456
5	\$62	\$0	\$62	\$1,229,596	\$0	\$1,229,596	\$1,229,596	\$0	\$1,229,596
6	\$63	\$0	\$63	\$1,254,157	\$0	\$1,254,157	\$1,254,157	\$0	\$1,254,157
7	\$66	\$0	\$66	\$1,279,240	\$0	\$1,279,240	\$1,279,240	\$0	\$1,279,240
8	\$66	\$0	\$66	\$1,304,825	\$0	\$1,304,825	\$1,304,825	\$0	\$1,304,825
9	\$67	\$0	\$67	\$1,330,921	\$0	\$1,330,921	\$1,330,921	\$0	\$1,330,921
10	\$69	\$0	\$69	\$1,357,540	\$0	\$1,357,540	\$1,357,540	\$0	\$1,357,540
11	\$70	\$0	\$70	\$1,384,690	\$0	\$1,384,690	\$1,384,690	\$0	\$1,384,690
12	\$71	\$0	\$71	\$1,412,384	\$0	\$1,412,384	\$1,412,384	\$0	\$1,412,384
13	\$73	\$0	\$73	\$1,440,632	\$0	\$1,440,632	\$1,440,632	\$0	\$1,440,632
14	\$74	\$0	\$74	\$1,469,445	\$0	\$1,469,445	\$1,469,445	\$0	\$1,469,445
15	\$76	\$0	\$76	\$1,124,125	\$0	\$1,124,125	\$1,124,125	\$0	\$1,124,125
16	\$77	\$0	\$77	\$764,405	\$0	\$764,405	\$764,405	\$0	\$764,405
17	\$79	\$0	\$79	\$389,847	\$0	\$389,847	\$389,847	\$0	\$389,847
Totals	\$1,148	\$0	\$1,148	\$18,696,903	\$0	\$18,696,903	\$18,696,903	\$0	\$18,696,903

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-kWh	\$/CCF-kWh
1	\$0	\$0	\$412,500	\$0	\$412,500	\$316	\$351	\$0	\$0	\$0
2	\$0	\$0	\$412,500	\$0	\$412,500	\$155	\$176	\$0	\$0	\$0
3	\$0	\$0	\$412,500	\$0	\$412,500	\$105	\$117	\$0	\$0	\$0
4	\$0	\$0	\$412,500	\$0	\$412,500	\$79	\$88	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$1,650,000	\$0	\$1,650,000	\$658	\$731	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$168,014	\$53,323	\$0	\$0	\$221,338	\$0	\$0	\$0	\$0
2	\$346,782	\$110,060	\$0	\$0	\$456,841	\$0	\$0	\$0	\$0
3	\$536,818	\$170,372	\$0	\$0	\$707,190	\$0	\$0	\$0	\$0
4	\$738,662	\$234,432	\$0	\$0	\$973,094	\$0	\$0	\$0	\$0
5	\$762,299	\$241,934	\$0	\$0	\$1,004,233	\$0	\$0	\$0	\$0
6	\$786,692	\$249,676	\$0	\$0	\$1,036,368	\$0	\$0	\$0	\$0
7	\$811,867	\$257,666	\$0	\$0	\$1,069,532	\$0	\$0	\$0	\$0
8	\$837,846	\$265,911	\$0	\$0	\$1,103,757	\$0	\$0	\$0	\$0
9	\$864,657	\$274,420	\$0	\$0	\$1,139,078	\$0	\$0	\$0	\$0
10	\$892,326	\$283,202	\$0	\$0	\$1,175,528	\$0	\$0	\$0	\$0
11	\$920,881	\$292,264	\$0	\$0	\$1,213,145	\$0	\$0	\$0	\$0
12	\$950,349	\$301,617	\$0	\$0	\$1,251,966	\$0	\$0	\$0	\$0
13	\$980,760	\$311,268	\$0	\$0	\$1,292,028	\$0	\$0	\$0	\$0
14	\$1,012,144	\$321,229	\$0	\$0	\$1,333,373	\$0	\$0	\$0	\$0
15	\$783,400	\$248,631	\$0	\$0	\$1,032,031	\$0	\$0	\$0	\$0
16	\$538,979	\$171,058	\$0	\$0	\$710,037	\$0	\$0	\$0	\$0
17	\$278,113	\$88,266	\$0	\$0	\$366,379	\$0	\$0	\$0	\$0
Totals	\$12,210,590	\$3,875,330	\$0	\$0	\$16,085,920	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$168,014	\$53,323	\$0	\$0	\$221,338	\$0	\$0	\$0	\$0
2	\$346,782	\$110,060	\$0	\$0	\$456,841	\$0	\$0	\$0	\$0
3	\$536,818	\$170,372	\$0	\$0	\$707,190	\$0	\$0	\$0	\$0
4	\$738,662	\$234,432	\$0	\$0	\$973,094	\$0	\$0	\$0	\$0
5	\$762,299	\$241,934	\$0	\$0	\$1,004,233	\$0	\$0	\$0	\$0
6	\$786,692	\$249,676	\$0	\$0	\$1,036,368	\$0	\$0	\$0	\$0
7	\$811,867	\$257,666	\$0	\$0	\$1,069,532	\$0	\$0	\$0	\$0
8	\$837,846	\$265,911	\$0	\$0	\$1,103,757	\$0	\$0	\$0	\$0
9	\$864,657	\$274,420	\$0	\$0	\$1,139,078	\$0	\$0	\$0	\$0
10	\$892,326	\$283,202	\$0	\$0	\$1,175,528	\$0	\$0	\$0	\$0
11	\$920,881	\$292,264	\$0	\$0	\$1,213,145	\$0	\$0	\$0	\$0
12	\$950,349	\$301,617	\$0	\$0	\$1,251,966	\$0	\$0	\$0	\$0
13	\$980,760	\$311,268	\$0	\$0	\$1,292,028	\$0	\$0	\$0	\$0
14	\$1,012,144	\$321,229	\$0	\$0	\$1,333,373	\$0	\$0	\$0	\$0
15	\$783,400	\$248,631	\$0	\$0	\$1,032,031	\$0	\$0	\$0	\$0
16	\$538,979	\$171,058	\$0	\$0	\$710,037	\$0	\$0	\$0	\$0
17	\$278,113	\$88,266	\$0	\$0	\$366,379	\$0	\$0	\$0	\$0
Totals	\$12,210,590	\$3,875,330	\$0	\$0	\$16,085,920	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ non-participants)	One-Time Investment	Annual Investment	Total Costs
1	4500	450	4500	450	4050	4050	\$675,000	\$0	\$675,000
2	4500	450	9000	900	8100	8100	\$675,000	\$0	\$675,000
3	4500	450	13500	1350	12150	12150	\$675,000	\$0	\$675,000
4	4500	450	18000	1800	16200	16200	\$675,000	\$0	\$675,000
5	0	0	18000	1800	16200	16200	\$0	\$0	\$0
6	0	0	18000	1800	16200	16200	\$0	\$0	\$0
7	0	0	18000	1800	16200	16200	\$0	\$0	\$0
8	0	0	18000	1800	16200	16200	\$0	\$0	\$0
9	0	0	18000	1800	16200	16200	\$0	\$0	\$0
10	0	0	18000	1800	16200	16200	\$0	\$0	\$0
11	0	0	13500	1350	12150	12150	\$0	\$0	\$0
12	0	0	9000	900	8100	8100	\$0	\$0	\$0
13	0	0	4500	450	4050	4050	\$0	\$0	\$0
Totals	18000	1800	180000	18000	162000	162000	\$2,700,000	\$0	\$2,700,000

Impacts and Savings																																		
Per Participant										Electric Impacts/Savings										Yearly Incremental (Per Participant * Incremental Participants)								Gas Impacts/Savings						
Year	kW	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	WBH	WBH (net)	WBH	WBH (net)	kW	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	WBH	WBH (net)	WBH	WBH (net)	kW	kW (net)	Summer Con kW	Summer Con (net)	Winter Con kW	Winter Con (net)	WBH	WBH (net)	CO2	CO2 (net)	CO2	CO2 (net)		
																																	CO2	CO2 (net)
1	0.06	0.05	0.04	0.03	0.04	0.04	293	264	251	226	166	149	177	159	1,318.692	1,186.823	251	226	166	149	177	159	1,318.692	1,186.823	0	0	0	0	0	0	0	0		
2	0.06	0.05	0.04	0.03	0.04	0.04	293	264	501	451	331	298	354	318	2,637.385	2,373.646	251	226	166	149	177	159	1,318.692	1,186.823	0	0	0	0	0	0	0	0		
3	0.06	0.05	0.04	0.03	0.04	0.04	293	264	752	677	497	447	530	477	3,956.077	3,560.469	251	226	166	149	177	159	1,318.692	1,186.823	0	0	0	0	0	0	0	0		
4	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	251	226	166	149	177	159	1,318.692	1,186.823	0	0	0	0	0	0	0	0		
5	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	0.06	0.05	0.04	0.03	0.04	0.04	293	264	1,003	902	662	596	707	637	5,274.769	4,747.292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0.06	0.05	0.04	0.03	0.04	0.04	293	264	752	677	497	447	530	477	3,956.077	3,560.469	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	0.06	0.05	0.04	0.03	0.04	0.04	293	264	501	451	331	298	354	318	2,637.385	2,373.646	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13	0.06	0.05	0.04	0.03	0.04	0.04	293	264	251	226	166	149	177	159	1,318.692	1,186.823	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals																																		

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Fuel	Net Fuel	Net Fuel
1	\$21	\$0	\$21	\$83,812	\$0	\$83,812	\$83,812	\$0	\$83,812
2	\$21	\$0	\$21	\$170,976	\$0	\$170,976	\$170,976	\$0	\$170,976
3	\$22	\$0	\$22	\$261,593	\$0	\$261,593	\$261,593	\$0	\$261,593
4	\$22	\$0	\$22	\$355,767	\$0	\$355,767	\$355,767	\$0	\$355,767
5	\$22	\$0	\$22	\$362,862	\$0	\$362,862	\$362,862	\$0	\$362,862
6	\$23	\$0	\$23	\$370,140	\$0	\$370,140	\$370,140	\$0	\$370,140
7	\$23	\$0	\$23	\$377,543	\$0	\$377,543	\$377,543	\$0	\$377,543
8	\$24	\$0	\$24	\$385,093	\$0	\$385,093	\$385,093	\$0	\$385,093
9	\$24	\$0	\$24	\$392,795	\$0	\$392,795	\$392,795	\$0	\$392,795
10	\$25	\$0	\$25	\$400,651	\$0	\$400,651	\$400,651	\$0	\$400,651
11	\$25	\$0	\$25	\$306,498	\$0	\$306,498	\$306,498	\$0	\$306,498
12	\$26	\$0	\$26	\$208,419	\$0	\$208,419	\$208,419	\$0	\$208,419
13	\$26	\$0	\$26	\$108,294	\$0	\$108,294	\$108,294	\$0	\$108,294
Totals	\$304	\$0	\$304	\$3,782,462	\$0	\$3,782,462	\$3,782,462	\$0	\$3,782,462

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Interest	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/CCF-Equ	\$/CCF-Equ
1	\$0	\$0	\$225,000	\$0	\$225,000	\$657	\$730	\$0	\$0	\$0
2	\$0	\$0	\$225,000	\$0	\$225,000	\$529	\$595	\$0	\$0	\$0
3	\$0	\$0	\$225,000	\$0	\$225,000	\$219	\$243	\$0	\$0	\$0
4	\$0	\$0	\$225,000	\$0	\$225,000	\$164	\$183	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$900,000	\$0	\$900,000	\$1,369	\$1,521	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$52,013	\$14,891	\$0	\$0	\$66,905	\$0	\$0	\$0	\$0
2	\$107,356	\$30,735	\$0	\$0	\$138,091	\$0	\$0	\$0	\$0
3	\$166,187	\$47,578	\$0	\$0	\$213,765	\$0	\$0	\$0	\$0
4	\$228,673	\$65,467	\$0	\$0	\$294,140	\$0	\$0	\$0	\$0
5	\$235,991	\$67,562	\$0	\$0	\$303,553	\$0	\$0	\$0	\$0
6	\$243,542	\$69,724	\$0	\$0	\$313,267	\$0	\$0	\$0	\$0
7	\$251,336	\$71,955	\$0	\$0	\$323,291	\$0	\$0	\$0	\$0
8	\$259,378	\$74,258	\$0	\$0	\$333,636	\$0	\$0	\$0	\$0
9	\$267,679	\$76,634	\$0	\$0	\$344,313	\$0	\$0	\$0	\$0
10	\$276,244	\$79,087	\$0	\$0	\$355,331	\$0	\$0	\$0	\$0
11	\$213,813	\$61,213	\$0	\$0	\$275,026	\$0	\$0	\$0	\$0
12	\$147,103	\$42,115	\$0	\$0	\$189,218	\$0	\$0	\$0	\$0
13	\$75,905	\$21,731	\$0	\$0	\$97,636	\$0	\$0	\$0	\$0
Totals	\$2,525,221	\$722,951	\$0	\$0	\$3,248,171	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$52,013	\$14,891	\$0	\$0	\$66,905	\$0	\$0	\$0	\$0
2	\$107,356	\$30,735	\$0	\$0	\$138,091	\$0	\$0	\$0	\$0
3	\$166,187	\$47,578	\$0	\$0	\$213,765	\$0	\$0	\$0	\$0
4	\$228,673	\$65,467	\$0	\$0	\$294,140	\$0	\$0	\$0	\$0
5	\$235,991	\$67,562	\$0	\$0	\$303,553	\$0	\$0	\$0	\$0
6	\$243,542	\$69,724	\$0	\$0	\$313,267	\$0	\$0	\$0	\$0
7	\$251,336	\$71,955	\$0	\$0	\$323,291	\$0	\$0	\$0	\$0
8	\$259,378	\$74,258	\$0	\$0	\$333,636	\$0	\$0	\$0	\$0
9	\$267,679	\$76,634	\$0	\$0	\$344,313	\$0	\$0	\$0	\$0
10	\$276,244	\$79,087	\$0	\$0	\$355,331	\$0	\$0	\$0	\$0
11	\$213,813	\$61,213	\$0	\$0	\$275,026	\$0	\$0	\$0	\$0
12	\$147,103	\$42,115	\$0	\$0	\$189,218	\$0	\$0	\$0	\$0
13	\$75,905	\$21,731	\$0	\$0	\$97,636	\$0	\$0	\$0	\$0
Totals	\$2,525,221	\$722,951	\$0	\$0	\$3,248,171	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved					
	Administration	Implementation	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF	\$/kWh
1	\$0	\$0	\$35,000	\$0	\$35,000	\$593	\$659	\$0	\$0	\$0
2	\$0	\$0	\$35,000	\$0	\$35,000	\$297	\$330	\$0	\$0	\$0
3	\$0	\$0	\$35,000	\$0	\$35,000	\$198	\$220	\$0	\$0	\$0
4	\$0	\$0	\$35,000	\$0	\$35,000	\$148	\$165	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$140,000	\$0	\$140,000	\$1,236	\$1,373	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$9,785	\$3,502	\$0	\$0	\$13,286	\$0	\$0	\$0	\$0
2	\$20,196	\$7,227	\$0	\$0	\$27,423	\$0	\$0	\$0	\$0
3	\$31,263	\$11,186	\$0	\$0	\$42,451	\$0	\$0	\$0	\$0
4	\$43,018	\$15,394	\$0	\$0	\$58,412	\$0	\$0	\$0	\$0
5	\$44,394	\$15,887	\$0	\$0	\$60,281	\$0	\$0	\$0	\$0
6	\$45,815	\$16,395	\$0	\$0	\$62,210	\$0	\$0	\$0	\$0
7	\$47,281	\$16,920	\$0	\$0	\$64,201	\$0	\$0	\$0	\$0
8	\$48,794	\$17,461	\$0	\$0	\$66,256	\$0	\$0	\$0	\$0
9	\$50,356	\$18,020	\$0	\$0	\$68,376	\$0	\$0	\$0	\$0
10	\$51,967	\$18,597	\$0	\$0	\$70,564	\$0	\$0	\$0	\$0
11	\$53,630	\$19,192	\$0	\$0	\$72,822	\$0	\$0	\$0	\$0
12	\$55,346	\$19,806	\$0	\$0	\$75,152	\$0	\$0	\$0	\$0
13	\$57,117	\$20,440	\$0	\$0	\$77,557	\$0	\$0	\$0	\$0
14	\$58,945	\$21,094	\$0	\$0	\$80,039	\$0	\$0	\$0	\$0
15	\$60,831	\$21,769	\$0	\$0	\$82,600	\$0	\$0	\$0	\$0
16	\$47,083	\$16,849	\$0	\$0	\$63,932	\$0	\$0	\$0	\$0
17	\$32,393	\$11,592	\$0	\$0	\$43,985	\$0	\$0	\$0	\$0
18	\$16,715	\$5,982	\$0	\$0	\$22,697	\$0	\$0	\$0	\$0
Totals	\$774,929	\$277,315	\$0	\$0	\$1,052,244	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$9,785	\$3,502	\$0	\$0	\$13,286	\$0	\$0	\$0	\$0
2	\$20,196	\$7,227	\$0	\$0	\$27,423	\$0	\$0	\$0	\$0
3	\$31,263	\$11,186	\$0	\$0	\$42,451	\$0	\$0	\$0	\$0
4	\$43,018	\$15,394	\$0	\$0	\$58,412	\$0	\$0	\$0	\$0
5	\$44,394	\$15,887	\$0	\$0	\$60,281	\$0	\$0	\$0	\$0
6	\$45,815	\$16,395	\$0	\$0	\$62,210	\$0	\$0	\$0	\$0
7	\$47,281	\$16,920	\$0	\$0	\$64,201	\$0	\$0	\$0	\$0
8	\$48,794	\$17,461	\$0	\$0	\$66,256	\$0	\$0	\$0	\$0
9	\$50,356	\$18,020	\$0	\$0	\$68,376	\$0	\$0	\$0	\$0
10	\$51,967	\$18,597	\$0	\$0	\$70,564	\$0	\$0	\$0	\$0
11	\$53,630	\$19,192	\$0	\$0	\$72,822	\$0	\$0	\$0	\$0
12	\$55,346	\$19,806	\$0	\$0	\$75,152	\$0	\$0	\$0	\$0
13	\$57,117	\$20,440	\$0	\$0	\$77,557	\$0	\$0	\$0	\$0
14	\$58,945	\$21,094	\$0	\$0	\$80,039	\$0	\$0	\$0	\$0
15	\$60,831	\$21,769	\$0	\$0	\$82,600	\$0	\$0	\$0	\$0
16	\$47,083	\$16,849	\$0	\$0	\$63,932	\$0	\$0	\$0	\$0
17	\$32,393	\$11,592	\$0	\$0	\$43,985	\$0	\$0	\$0	\$0
18	\$16,715	\$5,982	\$0	\$0	\$22,697	\$0	\$0	\$0	\$0
Totals	\$774,929	\$277,315	\$0	\$0	\$1,052,244	\$0	\$0	\$0	\$0

Utility Program Costs											
Year	Overall Costs				Total Costs per kW, kWh, and CCF Saved						
	Administration	Implementation	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh	\$/CCF	\$/kWh	
1	\$0	\$0	\$45,000	\$0	\$45,000	\$441	\$490	\$0	\$0	\$0	\$0
2	\$0	\$0	\$45,000	\$0	\$45,000	\$220	\$245	\$0	\$0	\$0	\$0
3	\$0	\$0	\$45,000	\$0	\$45,000	\$147	\$163	\$0	\$0	\$0	\$0
4	\$0	\$0	\$45,000	\$0	\$45,000	\$110	\$122	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$180,000	\$0	\$180,000	\$219	\$1,021	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$13,873	\$3,447	\$0	\$0	\$17,319	\$0	\$0	\$0	\$0
2	\$28,633	\$7,114	\$0	\$0	\$35,747	\$0	\$0	\$0	\$0
3	\$44,324	\$11,012	\$0	\$0	\$55,336	\$0	\$0	\$0	\$0
4	\$60,990	\$15,152	\$0	\$0	\$76,143	\$0	\$0	\$0	\$0
5	\$62,942	\$16,637	\$0	\$0	\$79,579	\$0	\$0	\$0	\$0
6	\$64,956	\$16,138	\$0	\$0	\$81,094	\$0	\$0	\$0	\$0
7	\$67,035	\$16,654	\$0	\$0	\$83,689	\$0	\$0	\$0	\$0
8	\$69,180	\$17,187	\$0	\$0	\$86,367	\$0	\$0	\$0	\$0
9	\$71,394	\$17,737	\$0	\$0	\$89,131	\$0	\$0	\$0	\$0
10	\$73,678	\$18,304	\$0	\$0	\$91,983	\$0	\$0	\$0	\$0
11	\$76,036	\$18,880	\$0	\$0	\$94,916	\$0	\$0	\$0	\$0
12	\$78,469	\$19,465	\$0	\$0	\$97,934	\$0	\$0	\$0	\$0
13	\$80,980	\$20,118	\$0	\$0	\$101,099	\$0	\$0	\$0	\$0
14	\$83,572	\$20,762	\$0	\$0	\$104,334	\$0	\$0	\$0	\$0
15	\$86,246	\$21,427	\$0	\$0	\$107,673	\$0	\$0	\$0	\$0
16	\$88,994	\$21,984	\$0	\$0	\$110,978	\$0	\$0	\$0	\$0
17	\$45,927	\$11,410	\$0	\$0	\$57,337	\$0	\$0	\$0	\$0
18	\$23,698	\$5,888	\$0	\$0	\$29,586	\$0	\$0	\$0	\$0
Totals	\$1,098,689	\$272,955	\$0	\$0	\$1,371,644	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total	Total
1	\$13,873	\$3,447	\$0	\$0	\$17,319	\$0	\$0	\$0	\$0
2	\$28,633	\$7,114	\$0	\$0	\$35,747	\$0	\$0	\$0	\$0
3	\$44,324	\$11,012	\$0	\$0	\$55,336	\$0	\$0	\$0	\$0
4	\$60,990	\$15,152	\$0	\$0	\$76,143	\$0	\$0	\$0	\$0
5	\$62,942	\$16,637	\$0	\$0	\$79,579	\$0	\$0	\$0	\$0
6	\$64,956	\$16,138	\$0	\$0	\$81,094	\$0	\$0	\$0	\$0
7	\$67,035	\$16,654	\$0	\$0	\$83,689	\$0	\$0	\$0	\$0
8	\$69,180	\$17,187	\$0	\$0	\$86,367	\$0	\$0	\$0	\$0
9	\$71,394	\$17,737	\$0	\$0	\$89,131	\$0	\$0	\$0	\$0
10	\$73,678	\$18,304	\$0	\$0	\$91,983	\$0	\$0	\$0	\$0
11	\$76,036	\$18,880	\$0	\$0	\$94,916	\$0	\$0	\$0	\$0
12	\$78,469	\$19,465	\$0	\$0	\$97,934	\$0	\$0	\$0	\$0
13	\$80,980	\$20,118	\$0	\$0	\$101,099	\$0	\$0	\$0	\$0
14	\$83,572	\$20,762	\$0	\$0	\$104,334	\$0	\$0	\$0	\$0
15	\$86,246	\$21,427	\$0	\$0	\$107,673	\$0	\$0	\$0	\$0
16	\$88,994	\$21,984	\$0	\$0	\$110,978	\$0	\$0	\$0	\$0
17	\$45,927	\$11,410	\$0	\$0	\$57,337	\$0	\$0	\$0	\$0
18	\$23,698	\$5,888	\$0	\$0	\$29,586	\$0	\$0	\$0	\$0
Totals	\$1,098,689	\$272,955	\$0	\$0	\$1,371,644	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/CCF	\$/kWh/Net	\$/CCF/Net
1	\$97,485	\$447,250	\$650,000	\$41,902	\$1,236,637	\$1,148	\$1,276	\$0	\$0	\$0
2	\$100,897	\$447,250	\$650,000	\$27,440	\$1,225,587	\$969	\$935	\$0	\$0	\$0
3	\$104,429	\$447,250	\$650,000	\$27,989	\$1,229,668	\$381	\$423	\$0	\$0	\$0
4	\$108,004	\$447,250	\$650,000	\$43,049	\$1,248,303	\$290	\$322	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$410,885	\$1,788,000	\$2,600,000	\$140,880	\$4,940,775	\$2,398	\$2,653	\$1	\$1	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$183,572	\$63,979	\$0	\$0	\$247,551	\$0	\$0	\$0		
2	\$378,892	\$132,054	\$0	\$0	\$510,945	\$0	\$0	\$0		
3	\$506,524	\$204,419	\$0	\$0	\$710,943	\$0	\$0	\$0		
4	\$807,057	\$281,281	\$0	\$0	\$1,088,338	\$0	\$0	\$0		
5	\$832,883	\$290,282	\$0	\$0	\$1,123,165	\$0	\$0	\$0		
6	\$859,536	\$299,571	\$0	\$0	\$1,159,106	\$0	\$0	\$0		
7	\$887,041	\$309,157	\$0	\$0	\$1,196,198	\$0	\$0	\$0		
8	\$915,426	\$319,050	\$0	\$0	\$1,234,476	\$0	\$0	\$0		
9	\$944,720	\$329,259	\$0	\$0	\$1,273,979	\$0	\$0	\$0		
10	\$974,951	\$339,796	\$0	\$0	\$1,314,746	\$0	\$0	\$0		
11	\$1,006,149	\$350,689	\$0	\$0	\$1,356,838	\$0	\$0	\$0		
12	\$1,038,346	\$361,891	\$0	\$0	\$1,400,236	\$0	\$0	\$0		
13	\$1,071,573	\$373,471	\$0	\$0	\$1,445,044	\$0	\$0	\$0		
14	\$1,105,863	\$385,422	\$0	\$0	\$1,491,285	\$0	\$0	\$0		
15	\$1,141,251	\$397,756	\$0	\$0	\$1,539,007	\$0	\$0	\$0		
16	\$883,328	\$307,863	\$0	\$0	\$1,191,191	\$0	\$0	\$0		
17	\$607,730	\$211,810	\$0	\$0	\$819,539	\$0	\$0	\$0		
18	\$313,589	\$109,294	\$0	\$0	\$422,882	\$0	\$0	\$0		
Totals	\$14,538,429	\$5,067,022	\$0	\$0	\$19,605,452	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$183,572	\$63,979	\$0	\$0	\$247,551	\$0	\$0	\$0		
2	\$378,892	\$132,054	\$0	\$0	\$510,945	\$0	\$0	\$0		
3	\$506,524	\$204,419	\$0	\$0	\$710,943	\$0	\$0	\$0		
4	\$807,057	\$281,281	\$0	\$0	\$1,088,338	\$0	\$0	\$0		
5	\$832,883	\$290,282	\$0	\$0	\$1,123,165	\$0	\$0	\$0		
6	\$859,536	\$299,571	\$0	\$0	\$1,159,106	\$0	\$0	\$0		
7	\$887,041	\$309,157	\$0	\$0	\$1,196,198	\$0	\$0	\$0		
8	\$915,426	\$319,050	\$0	\$0	\$1,234,476	\$0	\$0	\$0		
9	\$944,720	\$329,259	\$0	\$0	\$1,273,979	\$0	\$0	\$0		
10	\$974,951	\$339,796	\$0	\$0	\$1,314,746	\$0	\$0	\$0		
11	\$1,006,149	\$350,689	\$0	\$0	\$1,356,838	\$0	\$0	\$0		
12	\$1,038,346	\$361,891	\$0	\$0	\$1,400,236	\$0	\$0	\$0		
13	\$1,071,573	\$373,471	\$0	\$0	\$1,445,044	\$0	\$0	\$0		
14	\$1,105,863	\$385,422	\$0	\$0	\$1,491,285	\$0	\$0	\$0		
15	\$1,141,251	\$397,756	\$0	\$0	\$1,539,007	\$0	\$0	\$0		
16	\$883,328	\$307,863	\$0	\$0	\$1,191,191	\$0	\$0	\$0		
17	\$607,730	\$211,810	\$0	\$0	\$819,539	\$0	\$0	\$0		
18	\$313,589	\$109,294	\$0	\$0	\$422,882	\$0	\$0	\$0		
Totals	\$14,538,429	\$5,067,022	\$0	\$0	\$19,605,452	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (w/ free riders)	Cumulative Participants (w/ no-responders)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$0	\$0	\$0
2	700	140	1400	280	1120	1120	\$0	\$0	\$0
3	700	140	2100	420	1680	1680	\$0	\$0	\$0
4	700	140	2800	560	2240	2240	\$0	\$0	\$0
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	3800	880	42000	8400	33600	33600	\$0	\$0	\$0

Impacts and Savings																									
Year	Electric Impacts/Savings															Gas Impacts/Savings									
	Per Participant					Cumulative										Yearly Incremental (Per Participant * Incremental Participants)					Per Participant				
	kWh	kWh (net)	Summer Cost (kW)	Summer Cost (net)	Winter Cost (kW)	Winter Cost (net)	kWh	kWh (net)	kWh	kWh (net)	kW	kW (net)	Summer Cost (kW)	Summer Cost (net)	Winter Cost (kW)	Winter Cost (net)	kWh	kWh (net)	CCF	CCF (net)	CCF	CCF (net)	CCF	CCF (net)	
1	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	222	178	222	178	178	0	0	0	0	0	0	0	0	0	0	
2	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	444	355	444	355	0	0	0	0	0	0	0	0	0	0	0	
3	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	667	533	667	533	0	0	0	0	0	0	0	0	0	0	0	
4	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
5	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
6	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
7	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
8	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
9	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
10	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
11	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
12	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
13	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
14	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
15	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	889	711	889	711	0	0	0	0	0	0	0	0	0	0	0	
16	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	667	533	667	533	0	0	0	0	0	0	0	0	0	0	0	
17	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	444	355	444	355	0	0	0	0	0	0	0	0	0	0	0	
18	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	0.00	222	178	222	178	0	0	0	0	0	0	0	0	0	0	0	
Totals																									

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Perisist	Net Free/Perisist	Total	Net Fuel	Net Fuel	Net Fuel
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs						Total Costs per kW, kWh, and CCF Saved					
Year	Overall Costs				Total	\$/kW	Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Investment	Other			\$/kWh	\$/kWh/yr	\$/CCF	\$/CCF/yr	
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario							
Year	Cumulative Electric				Total	Cumulative Gas	
	Energy	Capacity	T&D	Auxiliary		Gas Distribution	Gas Fuel
1	\$0	\$17,760	\$0	\$0	\$17,760	\$0	\$0
2	\$0	\$36,657	\$0	\$0	\$36,657	\$0	\$0
3	\$0	\$56,745	\$0	\$0	\$56,745	\$0	\$0
4	\$0	\$78,081	\$0	\$0	\$78,081	\$0	\$0
5	\$0	\$80,580	\$0	\$0	\$80,580	\$0	\$0
6	\$0	\$83,158	\$0	\$0	\$83,158	\$0	\$0
7	\$0	\$85,819	\$0	\$0	\$85,819	\$0	\$0
8	\$0	\$88,566	\$0	\$0	\$88,566	\$0	\$0
9	\$0	\$91,400	\$0	\$0	\$91,400	\$0	\$0
10	\$0	\$94,325	\$0	\$0	\$94,325	\$0	\$0
11	\$0	\$97,343	\$0	\$0	\$97,343	\$0	\$0
12	\$0	\$100,458	\$0	\$0	\$100,458	\$0	\$0
13	\$0	\$103,673	\$0	\$0	\$103,673	\$0	\$0
14	\$0	\$106,990	\$0	\$0	\$106,990	\$0	\$0
15	\$0	\$110,414	\$0	\$0	\$110,414	\$0	\$0
16	\$0	\$85,460	\$0	\$0	\$85,460	\$0	\$0
17	\$0	\$58,797	\$0	\$0	\$58,797	\$0	\$0
18	\$0	\$30,339	\$0	\$0	\$30,339	\$0	\$0
Totals	\$0	\$1,406,564	\$0	\$0	\$1,406,564	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)							
Year	Cumulative Electric				Total	Cumulative Gas	
	Energy	Capacity	T&D	Auxiliary		Gas Distribution	Gas Fuel
1	\$0	\$17,760	\$0	\$0	\$17,760	\$0	\$0
2	\$0	\$36,657	\$0	\$0	\$36,657	\$0	\$0
3	\$0	\$56,745	\$0	\$0	\$56,745	\$0	\$0
4	\$0	\$78,081	\$0	\$0	\$78,081	\$0	\$0
5	\$0	\$80,580	\$0	\$0	\$80,580	\$0	\$0
6	\$0	\$83,158	\$0	\$0	\$83,158	\$0	\$0
7	\$0	\$85,819	\$0	\$0	\$85,819	\$0	\$0
8	\$0	\$88,566	\$0	\$0	\$88,566	\$0	\$0
9	\$0	\$91,400	\$0	\$0	\$91,400	\$0	\$0
10	\$0	\$94,325	\$0	\$0	\$94,325	\$0	\$0
11	\$0	\$97,343	\$0	\$0	\$97,343	\$0	\$0
12	\$0	\$100,458	\$0	\$0	\$100,458	\$0	\$0
13	\$0	\$103,673	\$0	\$0	\$103,673	\$0	\$0
14	\$0	\$106,990	\$0	\$0	\$106,990	\$0	\$0
15	\$0	\$110,414	\$0	\$0	\$110,414	\$0	\$0
16	\$0	\$85,460	\$0	\$0	\$85,460	\$0	\$0
17	\$0	\$58,797	\$0	\$0	\$58,797	\$0	\$0
18	\$0	\$30,339	\$0	\$0	\$30,339	\$0	\$0
Totals	\$0	\$1,406,564	\$0	\$0	\$1,406,564	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl free riders)	Cumulative Participants (incl free riders)	One-Time Investment	Annual Investment	Total Costs
1	500	100	500	100	400	400	\$0	\$0	\$0
2	500	100	1000	200	800	800	\$0	\$0	\$0
3	500	100	1500	300	1200	1200	\$0	\$0	\$0
4	500	100	2000	400	1600	1600	\$0	\$0	\$0
5	0	0	2000	400	1600	1600	\$0	\$0	\$0
6	0	0	2000	400	1600	1600	\$0	\$0	\$0
7	0	0	2000	400	1600	1600	\$0	\$0	\$0
8	0	0	2000	400	1600	1600	\$0	\$0	\$0
9	0	0	2000	400	1600	1600	\$0	\$0	\$0
10	0	0	2000	400	1600	1600	\$0	\$0	\$0
11	0	0	2000	400	1600	1600	\$0	\$0	\$0
12	0	0	2000	400	1600	1600	\$0	\$0	\$0
13	0	0	2000	400	1600	1600	\$0	\$0	\$0
14	0	0	2000	400	1600	1600	\$0	\$0	\$0
15	0	0	2000	400	1600	1600	\$0	\$0	\$0
16	0	0	1500	300	1200	1200	\$0	\$0	\$0
17	0	0	1000	200	800	800	\$0	\$0	\$0
18	0	0	500	100	400	400	\$0	\$0	\$0
Totals	2000	400	30000	6000	24000	24000	\$0	\$0	\$0

Impacts and Savings																								
Year	Electric Impacts/Savings														Gas Impacts/Savings									
	Per Participant				Cumulative				Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental					
	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	with	with (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	with	with (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	with	with (net)
1	0.32	0.25	0.32	0.25	0.00	0.00	159	127	159	127	0	0	0	0	159	127	159	127	0	0	0	0	0	0
2	0.32	0.25	0.32	0.25	0.00	0.00	317	254	317	254	0	0	0	0	317	254	317	254	0	0	0	0	0	0
3	0.32	0.25	0.32	0.25	0.00	0.00	476	381	476	381	0	0	0	0	476	381	476	381	0	0	0	0	0	0
4	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
5	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
6	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
7	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
8	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
9	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
10	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
11	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
12	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
13	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
14	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
15	0.32	0.25	0.32	0.25	0.00	0.00	635	508	635	508	0	0	0	0	635	508	635	508	0	0	0	0	0	0
16	0.32	0.25	0.32	0.25	0.00	0.00	476	381	476	381	0	0	0	0	476	381	476	381	0	0	0	0	0	0
17	0.32	0.25	0.32	0.25	0.00	0.00	317	254	317	254	0	0	0	0	317	254	317	254	0	0	0	0	0	0
18	0.32	0.25	0.32	0.25	0.00	0.00	159	127	159	127	0	0	0	0	159	127	159	127	0	0	0	0	0	0
Totals							0	0							0	0								

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW kWh, and CO ₂ Saved				
	Administration	Implementation	Incentives	Other	Total	\$/kW	\$/kW (net)	\$/kW (net)	\$/CO ₂	\$/CO ₂ (net)
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$12,686	\$0	\$0	\$12,686	\$0	\$0	\$0		
2	\$0	\$26,184	\$0	\$0	\$26,184	\$0	\$0	\$0		
3	\$0	\$40,532	\$0	\$0	\$40,532	\$0	\$0	\$0		
4	\$0	\$55,772	\$0	\$0	\$55,772	\$0	\$0	\$0		
5	\$0	\$71,557	\$0	\$0	\$71,557	\$0	\$0	\$0		
6	\$0	\$89,399	\$0	\$0	\$89,399	\$0	\$0	\$0		
7	\$0	\$110,000	\$0	\$0	\$110,000	\$0	\$0	\$0		
8	\$0	\$133,261	\$0	\$0	\$133,261	\$0	\$0	\$0		
9	\$0	\$159,286	\$0	\$0	\$159,286	\$0	\$0	\$0		
10	\$0	\$187,375	\$0	\$0	\$187,375	\$0	\$0	\$0		
11	\$0	\$218,531	\$0	\$0	\$218,531	\$0	\$0	\$0		
12	\$0	\$252,756	\$0	\$0	\$252,756	\$0	\$0	\$0		
13	\$0	\$290,052	\$0	\$0	\$290,052	\$0	\$0	\$0		
14	\$0	\$330,421	\$0	\$0	\$330,421	\$0	\$0	\$0		
15	\$0	\$373,867	\$0	\$0	\$373,867	\$0	\$0	\$0		
16	\$0	\$420,393	\$0	\$0	\$420,393	\$0	\$0	\$0		
17	\$0	\$469,998	\$0	\$0	\$469,998	\$0	\$0	\$0		
18	\$0	\$522,671	\$0	\$0	\$522,671	\$0	\$0	\$0		
Totals	\$0	\$1,004,689	\$0	\$0	\$1,004,689	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$12,686	\$0	\$0	\$12,686	\$0	\$0	\$0		
2	\$0	\$26,184	\$0	\$0	\$26,184	\$0	\$0	\$0		
3	\$0	\$40,532	\$0	\$0	\$40,532	\$0	\$0	\$0		
4	\$0	\$55,772	\$0	\$0	\$55,772	\$0	\$0	\$0		
5	\$0	\$71,557	\$0	\$0	\$71,557	\$0	\$0	\$0		
6	\$0	\$89,399	\$0	\$0	\$89,399	\$0	\$0	\$0		
7	\$0	\$110,000	\$0	\$0	\$110,000	\$0	\$0	\$0		
8	\$0	\$133,261	\$0	\$0	\$133,261	\$0	\$0	\$0		
9	\$0	\$159,286	\$0	\$0	\$159,286	\$0	\$0	\$0		
10	\$0	\$187,375	\$0	\$0	\$187,375	\$0	\$0	\$0		
11	\$0	\$218,531	\$0	\$0	\$218,531	\$0	\$0	\$0		
12	\$0	\$252,756	\$0	\$0	\$252,756	\$0	\$0	\$0		
13	\$0	\$290,052	\$0	\$0	\$290,052	\$0	\$0	\$0		
14	\$0	\$330,421	\$0	\$0	\$330,421	\$0	\$0	\$0		
15	\$0	\$373,867	\$0	\$0	\$373,867	\$0	\$0	\$0		
16	\$0	\$420,393	\$0	\$0	\$420,393	\$0	\$0	\$0		
17	\$0	\$469,998	\$0	\$0	\$469,998	\$0	\$0	\$0		
18	\$0	\$522,671	\$0	\$0	\$522,671	\$0	\$0	\$0		
Totals	\$0	\$1,004,689	\$0	\$0	\$1,004,689	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$0	\$0	\$0
2	700	140	1400	280	1120	1120	\$0	\$0	\$0
3	700	140	2100	420	1680	1680	\$0	\$0	\$0
4	700	140	2800	560	2240	2240	\$0	\$0	\$0
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	2800	560	42000	8400	33600	33600	\$0	\$0	\$0

Impacts and Savings																																			
Year	Electric Impacts/Savings												Gas Impacts/Savings																						
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental												
	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	With	With (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	With	With (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	With	With (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)					
1	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	223	178	223	178	0	0	0	0	223	178	223	178	0	0	0	0	0	0	0	0	0	0	0	0			
2	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	446	357	446	357	0	0	0	0	446	357	446	357	0	0	0	0	0	0	0	0	0	0	0	0			
3	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	669	535	669	535	0	0	0	0	669	535	669	535	0	0	0	0	0	0	0	0	0	0	0	0			
4	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	669	535	669	535	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	446	357	446	357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	223	178	223	178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals									0	0							0	0																	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and OCF Saved				
	Administration	Implementation	Operates	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/OCF (net)
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$17,827	\$0	\$0	\$17,827	\$0	\$0	\$0		
2	\$0	\$36,796	\$0	\$0	\$36,796	\$0	\$0	\$0		
3	\$0	\$56,960	\$0	\$0	\$56,960	\$0	\$0	\$0		
4	\$0	\$78,376	\$0	\$0	\$78,376	\$0	\$0	\$0		
5	\$0	\$80,884	\$0	\$0	\$80,884	\$0	\$0	\$0		
6	\$0	\$83,473	\$0	\$0	\$83,473	\$0	\$0	\$0		
7	\$0	\$86,144	\$0	\$0	\$86,144	\$0	\$0	\$0		
8	\$0	\$88,900	\$0	\$0	\$88,900	\$0	\$0	\$0		
9	\$0	\$91,745	\$0	\$0	\$91,745	\$0	\$0	\$0		
10	\$0	\$94,681	\$0	\$0	\$94,681	\$0	\$0	\$0		
11	\$0	\$97,711	\$0	\$0	\$97,711	\$0	\$0	\$0		
12	\$0	\$100,838	\$0	\$0	\$100,838	\$0	\$0	\$0		
13	\$0	\$104,064	\$0	\$0	\$104,064	\$0	\$0	\$0		
14	\$0	\$107,395	\$0	\$0	\$107,395	\$0	\$0	\$0		
15	\$0	\$110,831	\$0	\$0	\$110,831	\$0	\$0	\$0		
16	\$0	\$85,783	\$0	\$0	\$85,783	\$0	\$0	\$0		
17	\$0	\$59,019	\$0	\$0	\$59,019	\$0	\$0	\$0		
18	\$0	\$30,454	\$0	\$0	\$30,454	\$0	\$0	\$0		
Totals	\$0	\$1,411,882	\$0	\$0	\$1,411,882	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$17,827	\$0	\$0	\$17,827	\$0	\$0	\$0		
2	\$0	\$36,796	\$0	\$0	\$36,796	\$0	\$0	\$0		
3	\$0	\$56,960	\$0	\$0	\$56,960	\$0	\$0	\$0		
4	\$0	\$78,376	\$0	\$0	\$78,376	\$0	\$0	\$0		
5	\$0	\$80,884	\$0	\$0	\$80,884	\$0	\$0	\$0		
6	\$0	\$83,473	\$0	\$0	\$83,473	\$0	\$0	\$0		
7	\$0	\$86,144	\$0	\$0	\$86,144	\$0	\$0	\$0		
8	\$0	\$88,900	\$0	\$0	\$88,900	\$0	\$0	\$0		
9	\$0	\$91,745	\$0	\$0	\$91,745	\$0	\$0	\$0		
10	\$0	\$94,681	\$0	\$0	\$94,681	\$0	\$0	\$0		
11	\$0	\$97,711	\$0	\$0	\$97,711	\$0	\$0	\$0		
12	\$0	\$100,838	\$0	\$0	\$100,838	\$0	\$0	\$0		
13	\$0	\$104,064	\$0	\$0	\$104,064	\$0	\$0	\$0		
14	\$0	\$107,395	\$0	\$0	\$107,395	\$0	\$0	\$0		
15	\$0	\$110,831	\$0	\$0	\$110,831	\$0	\$0	\$0		
16	\$0	\$85,783	\$0	\$0	\$85,783	\$0	\$0	\$0		
17	\$0	\$59,019	\$0	\$0	\$59,019	\$0	\$0	\$0		
18	\$0	\$30,454	\$0	\$0	\$30,454	\$0	\$0	\$0		
Totals	\$0	\$1,411,882	\$0	\$0	\$1,411,882	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net/Incl)	Cumulative Participants (Net/Incl)	One-Time Investment	Annual Investment	Total Costs
1	700	140	700	140	560	560	\$0	\$0	\$0
2	700	140	1400	280	1120	1120	\$0	\$0	\$0
3	700	140	2100	420	1680	1680	\$0	\$0	\$0
4	700	140	2800	560	2240	2240	\$0	\$0	\$0
5	0	0	2800	560	2240	2240	\$0	\$0	\$0
6	0	0	2800	560	2240	2240	\$0	\$0	\$0
7	0	0	2800	560	2240	2240	\$0	\$0	\$0
8	0	0	2800	560	2240	2240	\$0	\$0	\$0
9	0	0	2800	560	2240	2240	\$0	\$0	\$0
10	0	0	2800	560	2240	2240	\$0	\$0	\$0
11	0	0	2800	560	2240	2240	\$0	\$0	\$0
12	0	0	2800	560	2240	2240	\$0	\$0	\$0
13	0	0	2800	560	2240	2240	\$0	\$0	\$0
14	0	0	2800	560	2240	2240	\$0	\$0	\$0
15	0	0	2800	560	2240	2240	\$0	\$0	\$0
16	0	0	2100	420	1680	1680	\$0	\$0	\$0
17	0	0	1400	280	1120	1120	\$0	\$0	\$0
18	0	0	700	140	560	560	\$0	\$0	\$0
Totals	2800	560	42000	8400	33600	33600	\$0	\$0	\$0

Impacts and Savings																																		
Year	Electric Impacts/Savings												Gas Impacts/Savings																					
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental											
	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	Wth	Wth (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	Wth	Wth (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	Wth	Wth (net)	COF	COF (net)	COF	COF (net)	COF	COF (net)				
1	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	223	178	223	178	0	0	0	0	223	178	223	178	0	0	0	0	0	0	0	0	0	0	0	0		
2	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	446	357	446	357	0	0	0	0	446	357	446	357	0	0	0	0	0	0	0	0	0	0	0	0		
3	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	669	535	669	535	0	0	0	0	669	535	669	535	0	0	0	0	0	0	0	0	0	0	0	0		
4	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0		
5	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	892	714	892	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	669	535	669	535	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
17	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	446	357	446	357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18	0.32	0.25	0.32	0.25	0.00	0.00	0.00	0.00	223	178	223	178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals									0	0							0	0									0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CO ₂ Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$17,827	\$0	\$0	\$17,827	\$0	\$0	\$0		
2	\$0	\$36,796	\$0	\$0	\$36,796	\$0	\$0	\$0		
3	\$0	\$56,960	\$0	\$0	\$56,960	\$0	\$0	\$0		
4	\$0	\$78,376	\$0	\$0	\$78,376	\$0	\$0	\$0		
5	\$0	\$80,884	\$0	\$0	\$80,884	\$0	\$0	\$0		
6	\$0	\$83,473	\$0	\$0	\$83,473	\$0	\$0	\$0		
7	\$0	\$86,144	\$0	\$0	\$86,144	\$0	\$0	\$0		
8	\$0	\$88,900	\$0	\$0	\$88,900	\$0	\$0	\$0		
9	\$0	\$91,745	\$0	\$0	\$91,745	\$0	\$0	\$0		
10	\$0	\$94,681	\$0	\$0	\$94,681	\$0	\$0	\$0		
11	\$0	\$97,711	\$0	\$0	\$97,711	\$0	\$0	\$0		
12	\$0	\$100,838	\$0	\$0	\$100,838	\$0	\$0	\$0		
13	\$0	\$104,064	\$0	\$0	\$104,064	\$0	\$0	\$0		
14	\$0	\$107,395	\$0	\$0	\$107,395	\$0	\$0	\$0		
15	\$0	\$110,831	\$0	\$0	\$110,831	\$0	\$0	\$0		
16	\$0	\$85,783	\$0	\$0	\$85,783	\$0	\$0	\$0		
17	\$0	\$59,019	\$0	\$0	\$59,019	\$0	\$0	\$0		
18	\$0	\$30,454	\$0	\$0	\$30,454	\$0	\$0	\$0		
Totals	\$0	\$1,411,882	\$0	\$0	\$1,411,882	\$0	\$0	\$0		

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Total		
1	\$0	\$17,827	\$0	\$0	\$17,827	\$0	\$0	\$0		
2	\$0	\$36,796	\$0	\$0	\$36,796	\$0	\$0	\$0		
3	\$0	\$56,960	\$0	\$0	\$56,960	\$0	\$0	\$0		
4	\$0	\$78,376	\$0	\$0	\$78,376	\$0	\$0	\$0		
5	\$0	\$80,884	\$0	\$0	\$80,884	\$0	\$0	\$0		
6	\$0	\$83,473	\$0	\$0	\$83,473	\$0	\$0	\$0		
7	\$0	\$86,144	\$0	\$0	\$86,144	\$0	\$0	\$0		
8	\$0	\$88,900	\$0	\$0	\$88,900	\$0	\$0	\$0		
9	\$0	\$91,745	\$0	\$0	\$91,745	\$0	\$0	\$0		
10	\$0	\$94,681	\$0	\$0	\$94,681	\$0	\$0	\$0		
11	\$0	\$97,711	\$0	\$0	\$97,711	\$0	\$0	\$0		
12	\$0	\$100,838	\$0	\$0	\$100,838	\$0	\$0	\$0		
13	\$0	\$104,064	\$0	\$0	\$104,064	\$0	\$0	\$0		
14	\$0	\$107,395	\$0	\$0	\$107,395	\$0	\$0	\$0		
15	\$0	\$110,831	\$0	\$0	\$110,831	\$0	\$0	\$0		
16	\$0	\$85,783	\$0	\$0	\$85,783	\$0	\$0	\$0		
17	\$0	\$59,019	\$0	\$0	\$59,019	\$0	\$0	\$0		
18	\$0	\$30,454	\$0	\$0	\$30,454	\$0	\$0	\$0		
Totals	\$0	\$1,411,882	\$0	\$0	\$1,411,882	\$0	\$0	\$0		

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net Free Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual Investment	Total Costs
1	5000	0	5000	0	5000	5000	\$0	\$0	\$0
2	5000	0	10000	0	10000	10000	\$0	\$0	\$0
3	5000	0	15000	0	15000	15000	\$0	\$0	\$0
4	5000	0	20000	0	20000	20000	\$0	\$0	\$0
5	0	0	20000	0	20000	20000	\$0	\$0	\$0
6	0	0	20000	0	20000	20000	\$0	\$0	\$0
7	0	0	20000	0	20000	20000	\$0	\$0	\$0
8	0	0	20000	0	20000	20000	\$0	\$0	\$0
9	0	0	20000	0	20000	20000	\$0	\$0	\$0
10	0	0	20000	0	20000	20000	\$0	\$0	\$0
11	0	0	15000	0	15000	15000	\$0	\$0	\$0
12	0	0	10000	0	10000	10000	\$0	\$0	\$0
13	0	0	5000	0	5000	5000	\$0	\$0	\$0
Totals	20000	0	200000	0	200000	200000	\$0	\$0	\$0

Impacts and Savings																																	
Year	Electric Impacts/Savings														Gas Impacts/Savings																		
	Per Participant							Cumulative							Yearly Incremental (Per Participant * Incremental Participants)					Per Participant		Cumulative		Yearly Incremental									
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)			
1	0.1	0.1	0.1	0.1	0.1	0.1	794	794	502	502	449	449	449	440	440	3,967,500	3,967,500	502	502	449	449	449	440	440	3,967,500	3,967,500	0	0	0	0	0	0	
2	0.1	0.1	0.1	0.1	0.1	0.1	794	794	1,003	1,003	898	898	879	879	7,935,000	7,935,000	502	502	449	449	449	440	440	3,967,500	3,967,500	0	0	0	0	0	0		
3	0.1	0.1	0.1	0.1	0.1	0.1	794	794	1,505	1,505	1,347	1,347	1,319	1,319	11,902,500	11,902,500	502	502	449	449	449	440	440	3,967,500	3,967,500	0	0	0	0	0	0		
4	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	502	502	449	449	449	440	440	3,967,500	3,967,500	0	0	0	0	0	0		
5	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.1	0.1	0.1	0.1	0.1	794	794	2,006	2,006	1,796	1,796	1,758	1,758	15,870,000	15,870,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.1	0.1	0.1	0.1	0.1	0.1	794	794	1,505	1,505	1,347	1,347	1,319	1,319	11,902,500	11,902,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.1	0.1	0.1	0.1	0.1	0.1	794	794	1,003	1,003	898	898	879	879	7,935,000	7,935,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.1	0.1	0.1	0.1	0.1	0.1	794	794	502	502	449	449	449	440	440	3,967,500	3,967,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals							10,316	10,316							158,700,004	158,700,004									15,870,000	15,870,000	0	0	0	0	0	0	

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant	Net Free/Participant
1	\$59	\$0	\$59	\$297,209	\$0	\$297,209	\$297,209	\$0	\$297,209
2	\$61	\$0	\$61	\$606,307	\$0	\$606,307	\$606,307	\$0	\$606,307
3	\$62	\$0	\$62	\$927,649	\$0	\$927,649	\$927,649	\$0	\$927,649
4	\$63	\$0	\$63	\$1,291,603	\$0	\$1,291,603	\$1,291,603	\$0	\$1,291,603
5	\$64	\$0	\$64	\$1,286,835	\$0	\$1,286,835	\$1,286,835	\$0	\$1,286,835
6	\$66	\$0	\$66	\$1,312,571	\$0	\$1,312,571	\$1,312,571	\$0	\$1,312,571
7	\$67	\$0	\$67	\$1,338,923	\$0	\$1,338,923	\$1,338,923	\$0	\$1,338,923
8	\$68	\$0	\$68	\$1,365,599	\$0	\$1,365,599	\$1,365,599	\$0	\$1,365,599
9	\$70	\$0	\$70	\$1,392,911	\$0	\$1,392,911	\$1,392,911	\$0	\$1,392,911
10	\$71	\$0	\$71	\$1,420,770	\$0	\$1,420,770	\$1,420,770	\$0	\$1,420,770
11	\$72	\$0	\$72	\$1,086,889	\$0	\$1,086,889	\$1,086,889	\$0	\$1,086,889
12	\$74	\$0	\$74	\$739,084	\$0	\$739,084	\$739,084	\$0	\$739,084
13	\$75	\$0	\$75	\$376,933	\$0	\$376,933	\$376,933	\$0	\$376,933
Totals	\$873	\$0	\$873	\$13,413,183	\$0	\$13,413,183	\$13,413,183	\$0	\$13,413,183

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and OCF Saved					
	Administration	Implementation	Benefits	Other	Total	\$/kW	\$/kWh	\$/kWh	\$/kWh	\$/kWh
1	\$210,376	\$632,987	\$175,000	\$0	\$1,018,363	\$1,146	\$1,146	\$0	\$0	\$0
2	\$214,734	\$644,380	\$175,000	\$0	\$1,034,114	\$582	\$582	\$0	\$0	\$0
3	\$219,195	\$655,979	\$200,000	\$0	\$1,075,175	\$403	\$403	\$0	\$0	\$0
4	\$237,675	\$667,787	\$200,000	\$0	\$1,105,462	\$311	\$311	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$881,981	\$2,601,133	\$750,000	\$0	\$4,233,114	\$2,443	\$2,443	\$1	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Admin/Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Gas Fuel	Total
1	\$172,294	\$44,852	\$0	\$0	\$217,147	\$0	\$0	\$0	\$0	\$0
2	\$355,616	\$92,575	\$0	\$0	\$448,191	\$0	\$0	\$0	\$0	\$0
3	\$550,493	\$143,306	\$0	\$0	\$693,799	\$0	\$0	\$0	\$0	\$0
4	\$757,478	\$197,189	\$0	\$0	\$954,667	\$0	\$0	\$0	\$0	\$0
5	\$781,718	\$203,499	\$0	\$0	\$985,217	\$0	\$0	\$0	\$0	\$0
6	\$906,733	\$210,011	\$0	\$0	\$1,016,744	\$0	\$0	\$0	\$0	\$0
7	\$832,548	\$216,731	\$0	\$0	\$1,049,280	\$0	\$0	\$0	\$0	\$0
8	\$858,190	\$223,667	\$0	\$0	\$1,082,857	\$0	\$0	\$0	\$0	\$0
9	\$886,684	\$230,824	\$0	\$0	\$1,117,508	\$0	\$0	\$0	\$0	\$0
10	\$915,058	\$238,210	\$0	\$0	\$1,153,268	\$0	\$0	\$0	\$0	\$0
11	\$708,255	\$184,375	\$0	\$0	\$892,630	\$0	\$0	\$0	\$0	\$0
12	\$487,279	\$128,850	\$0	\$0	\$616,129	\$0	\$0	\$0	\$0	\$0
13	\$251,436	\$65,455	\$0	\$0	\$316,891	\$0	\$0	\$0	\$0	\$0
Totals	\$8,364,782	\$2,177,544	\$0	\$0	\$10,542,326	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Gas Fuel	Total
1	\$172,294	\$44,852	\$0	\$0	\$217,147	\$0	\$0	\$0	\$0	\$0
2	\$355,616	\$92,575	\$0	\$0	\$448,191	\$0	\$0	\$0	\$0	\$0
3	\$550,493	\$143,306	\$0	\$0	\$693,799	\$0	\$0	\$0	\$0	\$0
4	\$757,478	\$197,189	\$0	\$0	\$954,667	\$0	\$0	\$0	\$0	\$0
5	\$781,718	\$203,499	\$0	\$0	\$985,217	\$0	\$0	\$0	\$0	\$0
6	\$906,733	\$210,011	\$0	\$0	\$1,016,744	\$0	\$0	\$0	\$0	\$0
7	\$832,548	\$216,731	\$0	\$0	\$1,049,280	\$0	\$0	\$0	\$0	\$0
8	\$858,190	\$223,667	\$0	\$0	\$1,082,857	\$0	\$0	\$0	\$0	\$0
9	\$886,684	\$230,824	\$0	\$0	\$1,117,508	\$0	\$0	\$0	\$0	\$0
10	\$915,058	\$238,210	\$0	\$0	\$1,153,268	\$0	\$0	\$0	\$0	\$0
11	\$708,255	\$184,375	\$0	\$0	\$892,630	\$0	\$0	\$0	\$0	\$0
12	\$487,279	\$128,850	\$0	\$0	\$616,129	\$0	\$0	\$0	\$0	\$0
13	\$251,436	\$65,455	\$0	\$0	\$316,891	\$0	\$0	\$0	\$0	\$0
Totals	\$8,364,782	\$2,177,544	\$0	\$0	\$10,542,326	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net Free Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual Investment	Total Costs
1	5000	0	5000	0	5000	5000	\$0	\$0	\$0
2	5000	0	10000	0	10000	10000	\$0	\$0	\$0
3	5000	0	15000	0	15000	15000	\$0	\$0	\$0
4	5000	0	20000	0	20000	20000	\$0	\$0	\$0
5	0	0	20000	0	20000	20000	\$0	\$0	\$0
6	0	0	20000	0	20000	20000	\$0	\$0	\$0
7	0	0	20000	0	20000	20000	\$0	\$0	\$0
8	0	0	20000	0	20000	20000	\$0	\$0	\$0
9	0	0	20000	0	20000	20000	\$0	\$0	\$0
10	0	0	20000	0	20000	20000	\$0	\$0	\$0
11	0	0	15000	0	15000	15000	\$0	\$0	\$0
12	0	0	10000	0	10000	10000	\$0	\$0	\$0
13	0	0	5000	0	5000	5000	\$0	\$0	\$0
Totals	20000	0	200000	0	200000	200000	\$0	\$0	\$0

Impacts and Savings																																	
Year	Electric Impacts/Savings																				Gas Impacts/Savings												
	Per Participant										Cumulative										Yearly Incremental (Per Participant * Incremental Participants)							Per Participant		Cumulative		Yearly Incremental	
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	WWh	WWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	
1	0.1	0.1	0.1	0.1	0.1	0.1	797	797	480	480	451	451	441	441	3,982,500	3,982,500	480	480	451	451	441	441	3,982,500	3,982,500	0	0	0	0	0	0	0	0	
2	0.1	0.1	0.1	0.1	0.1	0.1	797	797	960	960	901	901	882	882	7,965,000	7,965,000	480	480	451	451	441	441	3,982,500	3,982,500	0	0	0	0	0	0	0	0	
3	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,440	1,440	1,352	1,352	1,324	1,324	11,947,500	11,947,500	480	480	451	451	441	441	3,982,500	3,982,500	0	0	0	0	0	0	0	0	
4	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	480	480	451	451	441	441	3,982,500	3,982,500	0	0	0	0	0	0	0	0	
5	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,920	1,920	1,802	1,802	1,765	1,765	15,930,000	15,930,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0.1	0.1	0.1	0.1	0.1	0.1	797	797	1,440	1,440	1,352	1,352	1,324	1,324	11,947,500	11,947,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0.1	0.1	0.1	0.1	0.1	0.1	797	797	960	960	901	901	882	882	7,965,000	7,965,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0.1	0.1	0.1	0.1	0.1	0.1	797	797	480	480	451	451	441	441	3,982,500	3,982,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals							10,365	10,365							159,300,004	159,300,004									15,930,000	15,930,000	0	0	0	0	0	0	

Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Fuel)		
	Electric	Gas	Total	Net Free/Participant	Net Free/Participant	Total	Net Free/Participant	Net Free/Participant	Total
	Electric	Gas	Total	Electric	Gas	Total	Electric	Gas	Total
1	\$56	\$0	\$56	\$291,238	\$0	\$291,238	\$291,238	\$0	\$291,238
2	\$57	\$0	\$57	\$573,726	\$0	\$573,726	\$573,726	\$0	\$573,726
3	\$59	\$0	\$59	\$877,801	\$0	\$877,801	\$877,801	\$0	\$877,801
4	\$60	\$0	\$60	\$1,193,810	\$0	\$1,193,810	\$1,193,810	\$0	\$1,193,810
5	\$61	\$0	\$61	\$1,217,686	\$0	\$1,217,686	\$1,217,686	\$0	\$1,217,686
6	\$62	\$0	\$62	\$1,242,040	\$0	\$1,242,040	\$1,242,040	\$0	\$1,242,040
7	\$63	\$0	\$63	\$1,266,881	\$0	\$1,266,881	\$1,266,881	\$0	\$1,266,881
8	\$65	\$0	\$65	\$1,292,218	\$0	\$1,292,218	\$1,292,218	\$0	\$1,292,218
9	\$66	\$0	\$66	\$1,318,062	\$0	\$1,318,062	\$1,318,062	\$0	\$1,318,062
10	\$67	\$0	\$67	\$1,344,424	\$0	\$1,344,424	\$1,344,424	\$0	\$1,344,424
11	\$69	\$0	\$69	\$1,028,484	\$0	\$1,028,484	\$1,028,484	\$0	\$1,028,484
12	\$70	\$0	\$70	\$699,369	\$0	\$699,369	\$699,369	\$0	\$699,369
13	\$71	\$0	\$71	\$356,678	\$0	\$356,678	\$356,678	\$0	\$356,678
Totals	\$826	\$0	\$826	\$12,692,418	\$0	\$12,692,418	\$12,692,418	\$0	\$12,692,418

Utility Program Costs										
Year	Overall Costs				Total Costs per kW, kWh, and OCF Saved					
	Administration	Implementation	Investment	Other	Total	\$/kW	\$/kWh	\$/OCF	\$/kWh	\$/OCF (net)
1	\$210,376	\$632,987	\$175,000	\$0	\$1,018,363	\$1,142	\$1,142	\$0	\$0	\$0
2	\$214,734	\$644,380	\$175,000	\$0	\$1,034,114	\$580	\$580	\$0	\$0	\$0
3	\$219,195	\$655,979	\$200,000	\$0	\$1,075,175	\$402	\$402	\$0	\$0	\$0
4	\$237,675	\$667,787	\$200,000	\$0	\$1,105,462	\$310	\$310	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$881,981	\$2,601,133	\$750,000	\$0	\$4,233,114	\$2,434	\$2,434	\$1	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Admin/Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Gas Fuel	Total
1	\$172,729	\$45,022	\$0	\$0	\$217,750	\$0	\$0	\$0	\$0	\$0
2	\$356,512	\$92,925	\$0	\$0	\$449,437	\$0	\$0	\$0	\$0	\$0
3	\$551,880	\$143,948	\$0	\$0	\$695,728	\$0	\$0	\$0	\$0	\$0
4	\$759,387	\$197,934	\$0	\$0	\$957,321	\$0	\$0	\$0	\$0	\$0
5	\$763,687	\$204,268	\$0	\$0	\$967,956	\$0	\$0	\$0	\$0	\$0
6	\$908,765	\$210,805	\$0	\$0	\$1,019,570	\$0	\$0	\$0	\$0	\$0
7	\$834,646	\$217,551	\$0	\$0	\$1,052,196	\$0	\$0	\$0	\$0	\$0
8	\$861,354	\$224,512	\$0	\$0	\$1,085,867	\$0	\$0	\$0	\$0	\$0
9	\$888,918	\$231,697	\$0	\$0	\$1,120,615	\$0	\$0	\$0	\$0	\$0
10	\$917,363	\$238,111	\$0	\$0	\$1,156,474	\$0	\$0	\$0	\$0	\$0
11	\$710,039	\$185,072	\$0	\$0	\$895,111	\$0	\$0	\$0	\$0	\$0
12	\$488,507	\$127,330	\$0	\$0	\$615,836	\$0	\$0	\$0	\$0	\$0
13	\$252,070	\$65,702	\$0	\$0	\$317,772	\$0	\$0	\$0	\$0	\$0
Totals	\$8,385,856	\$2,185,777	\$0	\$0	\$10,571,633	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric				Cumulative Gas					
	Energy	Capacity	T&D	Arbitrage	Total	Gas Distribution	Gas Fuel	Total	Gas Fuel	Total
1	\$172,729	\$45,022	\$0	\$0	\$217,750	\$0	\$0	\$0	\$0	\$0
2	\$356,512	\$92,925	\$0	\$0	\$449,437	\$0	\$0	\$0	\$0	\$0
3	\$551,880	\$143,948	\$0	\$0	\$695,728	\$0	\$0	\$0	\$0	\$0
4	\$759,387	\$197,934	\$0	\$0	\$957,321	\$0	\$0	\$0	\$0	\$0
5	\$763,687	\$204,268	\$0	\$0	\$967,956	\$0	\$0	\$0	\$0	\$0
6	\$908,765	\$210,805	\$0	\$0	\$1,019,570	\$0	\$0	\$0	\$0	\$0
7	\$834,646	\$217,551	\$0	\$0	\$1,052,196	\$0	\$0	\$0	\$0	\$0
8	\$861,354	\$224,512	\$0	\$0	\$1,085,867	\$0	\$0	\$0	\$0	\$0
9	\$888,918	\$231,697	\$0	\$0	\$1,120,615	\$0	\$0	\$0	\$0	\$0
10	\$917,363	\$238,111	\$0	\$0	\$1,156,474	\$0	\$0	\$0	\$0	\$0
11	\$710,039	\$185,072	\$0	\$0	\$895,111	\$0	\$0	\$0	\$0	\$0
12	\$488,507	\$127,330	\$0	\$0	\$615,836	\$0	\$0	\$0	\$0	\$0
13	\$252,070	\$65,702	\$0	\$0	\$317,772	\$0	\$0	\$0	\$0	\$0
Totals	\$8,385,856	\$2,185,777	\$0	\$0	\$10,571,633	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																															
Year	Electric Impacts/Savings												Gas Impacts/Savings																		
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental								
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CO ₂ Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)
1	\$250,359	\$6,798	\$0	\$86,203	\$343,310	\$0	\$0	\$0	\$0	\$0
2	\$260,465	\$6,534	\$0	\$97,927	\$355,326	\$0	\$0	\$0	\$0	\$0
3	\$271,004	\$7,073	\$0	\$89,686	\$367,763	\$0	\$0	\$0	\$0	\$0
4	\$281,844	\$7,214	\$0	\$91,480	\$380,538	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$1,063,622	\$28,019	\$0	\$355,296	\$1,446,937	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CO ₂	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CO ₂	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																															
Year	Electric Impacts/Savings												Gas Impacts/Savings																		
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental								
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CO ₂ Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)
1	\$250,359	\$6,798	\$0	\$86,203	\$343,310	\$0	\$0	\$0	\$0	\$0
2	\$260,465	\$6,534	\$0	\$97,927	\$355,326	\$0	\$0	\$0	\$0	\$0
3	\$271,004	\$7,073	\$0	\$89,686	\$367,763	\$0	\$0	\$0	\$0	\$0
4	\$281,844	\$7,214	\$0	\$91,480	\$380,538	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$1,063,622	\$28,019	\$0	\$355,296	\$1,446,937	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CO ₂	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CO ₂	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl free riders)	Cumulative Participants (incl free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings												Gas Impacts/Savings																	
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental							
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and OCF Saved				
	Administration	Implementation	Hardware	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/OCF (net)
1	\$250,359	\$6,798	\$0	\$86,203	\$343,310	\$0	\$0	\$0	\$0	\$0
2	\$260,465	\$6,534	\$0	\$97,927	\$355,326	\$0	\$0	\$0	\$0	\$0
3	\$271,004	\$7,073	\$0	\$89,686	\$367,763	\$0	\$0	\$0	\$0	\$0
4	\$281,844	\$7,214	\$0	\$91,480	\$380,538	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$1,063,622	\$28,019	\$0	\$355,296	\$1,446,937	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Connectivity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	OCF	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	OCF	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings										Yearly Incremental (Per Participant * Incremental Participants)								Gas Impacts/Savings											
	Per Participant					Cumulative					Per Participant				Cumulative				Per Participant		Cumulative		Yearly Incremental							
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CO ₂ Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)
1	\$250,359	\$6,798	\$0	\$86,203	\$343,310	\$0	\$0	\$0	\$0	\$0
2	\$290,465	\$6,534	\$0	\$97,927	\$395,326	\$0	\$0	\$0	\$0	\$0
3	\$271,004	\$7,073	\$0	\$89,686	\$367,763	\$0	\$0	\$0	\$0	\$0
4	\$281,844	\$7,214	\$0	\$91,480	\$380,538	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$1,063,622	\$28,019	\$0	\$355,296	\$1,446,937	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total	
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total	
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																														
Year	Electric Impacts/Savings												Gas Impacts/Savings																	
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental							
	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin kWh	Winter Coin kW	Winter Coin kWh	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and OCF Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/OCF (net)
1	\$22,732	\$511,667	\$0	\$2,452	\$536,851	\$0	\$0	\$0	\$0	\$0
2	\$23,414	\$521,900	\$0	\$469	\$546,783	\$0	\$0	\$0	\$0	\$0
3	\$34,116	\$532,338	\$0	\$478	\$566,932	\$0	\$0	\$0	\$0	\$0
4	\$24,840	\$542,585	\$0	\$2,480	\$570,305	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$95,102	\$2,108,890	\$0	\$5,879	\$2,209,871	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	OCF	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	OCF	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (incl. free riders)	Cumulative Participants (incl. free riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																																
Year	Electric Impacts/Savings												Yearly Incremental (Per Participant * Incremental Participants)						Gas Impacts/Savings													
	Per Participant						Cumulative						Per Participant						Per Participant		Cumulative		Yearly Incremental									
	kW	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	kW	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	CO2	CO2 (net)	CO2	CO2 (net)	CO2	CO2 (net)		
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total	Net Free/Partist Electric	Net Free/Partist Gas	Net Free/Partist Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and OCF Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kWh (net)	\$/kWh (net)	\$/OCF	\$/OCF (net)
1	\$28,628	\$644,379	\$0	\$3,087	\$676,094	\$0	\$0	\$0	\$0	\$0
2	\$28,487	\$657,266	\$0	\$591	\$687,344	\$0	\$0	\$0	\$0	\$0
3	\$30,371	\$670,411	\$0	\$602	\$701,384	\$0	\$0	\$0	\$0	\$0
4	\$31,282	\$683,620	\$0	\$3,123	\$718,225	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$119,768	\$2,655,876	\$0	\$7,403	\$2,783,047	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Contingency	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Category	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Participation and Total Participant Costs									
Year	Participation						Total Participant Costs		
	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (Net Free Riders)	Cumulative Participants (Net Free Riders)	One-Time Investment	Annual Investment	Total Costs
1	0	0	0	0	0	0	\$0	\$0	\$0
2	0	0	0	0	0	0	\$0	\$0	\$0
3	0	0	0	0	0	0	\$0	\$0	\$0
4	0	0	0	0	0	0	\$0	\$0	\$0
5	0	0	0	0	0	0	\$0	\$0	\$0
6	0	0	0	0	0	0	\$0	\$0	\$0
7	0	0	0	0	0	0	\$0	\$0	\$0
Totals	0	0	0	0	0	0	\$0	\$0	\$0

Impacts and Savings																											
Year	Electric Impacts/Savings												Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Gas Impacts/Savings		Yearly Incremental				
	Per Participant						Cumulative						Yearly Incremental (Per Participant * Incremental Participants)						Per Participant		Cumulative		Yearly Incremental				
kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	Summer Coin kW	Summer Coin (net)	Winter Coin kW	Winter Coin (net)	kWh	kWh (net)	COF	COF (net)	COF	COF (net)	COF	COF (net)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lost Revenue Dollars									
Year	Lost Revenue per Participant			Cumulative Lost Revenue			Cumulative Lost Revenue (Net Free)		
	Electric	Gas	Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total	Net Free/Participant Electric	Net Free/Participant Gas	Net Free/Participant Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CO ₂ Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CO ₂ (net)
1	\$53,041	\$1,193,890	\$0	\$5,720	\$1,252,651	\$0	\$0	\$0	\$0	\$0
2	\$54,822	\$1,217,768	\$0	\$1,094	\$1,273,684	\$0	\$0	\$0	\$0	\$0
3	\$56,271	\$1,242,123	\$0	\$1,116	\$1,299,510	\$0	\$0	\$0	\$0	\$0
4	\$57,959	\$1,266,965	\$0	\$5,786	\$1,330,710	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$221,903	\$4,920,746	\$0	\$13,716	\$5,156,365	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Admin/Contingency	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)									
Year	Cumulative Electric					Cumulative Gas			
	Energy	Contingency	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	Gas Fuel	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Utility Program Costs										
Year	Overall Costs					Total Costs per kW, kWh, and CCF Saved				
	Administration	Implementation	Operations	Other	Total	\$/kW	\$/kW (net)	\$/kWh	\$/kWh (net)	\$/CCF (net)
1	\$66,798	\$1,503,550	\$0	\$7,204	\$1,577,552	\$0	\$0	\$0	\$0	\$0
2	\$68,902	\$1,533,621	\$0	\$1,379	\$1,603,901	\$0	\$0	\$0	\$0	\$0
3	\$70,866	\$1,564,293	\$0	\$1,406	\$1,636,565	\$0	\$0	\$0	\$0	\$0
4	\$72,992	\$1,595,579	\$0	\$7,287	\$1,675,858	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$279,458	\$6,197,043	\$0	\$17,275	\$6,493,776	\$0	\$0	\$0	\$0	\$0

Market-Based Avoided Costs (Net Free Riders/Persistence) for Today Scenario										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Admin/Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CCF	CCF (net)	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost-Based Avoided Costs (Net Free Riders/Persistence)										
Year	Cumulative Electric					Cumulative Gas				
	Energy	Capacity	T&D	Auxiliary	Total	Gas Distribution	Gas Fuel	CCF	CCF (net)	Total
1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

DSMore Output Reports

Appendix C

- C-1 Commercial Conservation and Rebates**
- C-2 Residential Conservation**
- C-3 Commercial Load Management**
- C-4 Residential Load Management**
- C-5 Residential Smart Energy Profile**
- C-6 Residential Low Income Weatherization**
- C-7 Residential Incentives**
- C-8 Residential Refrigerator Removal**
- C-9 Commercial Program Development and Administration**
- C-10 Residential Program Development and Administration**
- C-11 Commercial Customer Education and Public Information**
- C-12 Residential Customer Education and Public Information**

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	16.42	11.63	16.42	17.37	15.76	33.39
TRC Test	7.26	5.14	7.26	7.68	6.97	14.76
RIM Test	1.18	0.86	1.18	1.25	1.14	2.37
RIM (Net Fuel)	1.19	0.86	1.19	1.26	1.14	2.39
Societal Test	7.26	5.14	7.26	7.68	6.97	14.76
Participant Test	7.56	7.40	7.56	7.56	7.56	7.68

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$116,505,022	\$57,953,853	\$116,505,022	\$128,153,647	\$108,457,938	\$323,605,071
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$567,400	\$152,694	\$567,400	\$611,869	\$530,062	\$2,315,439
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$202,119,672	\$143,153,797	\$202,119,672	\$213,812,766	\$194,035,250	\$410,967,760
Administration Costs	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301
Implementation / Participation Costs	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647
Other / Miscellaneous Costs	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654
Incentives	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870
Total	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$116,505,022	\$57,953,853	\$116,505,022	\$128,153,647	\$108,457,938	\$323,605,071
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$567,400	\$152,694	\$567,400	\$611,869	\$530,062	\$2,315,439
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$202,119,672	\$143,153,797	\$202,119,672	\$213,812,766	\$194,035,250	\$410,967,760
Administration Costs	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301
Implementation / Participation Costs	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647
Other / Miscellaneous Costs	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654
Total	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$116,505,022	\$57,953,853	\$116,505,022	\$128,153,647	\$108,457,938	\$323,605,071
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$567,400	\$152,694	\$567,400	\$611,869	\$530,062	\$2,315,439
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$202,119,672	\$143,153,797	\$202,119,672	\$213,812,766	\$194,035,250	\$410,967,760
Administration Costs	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301
Implementation / Participation Costs	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647
Other / Miscellaneous Costs	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654
Incentives	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870
Total	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472	\$12,308,472
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$157,301,490	\$154,067,162	\$157,301,490	\$157,301,490	\$157,301,490	\$159,524,992
Lost Revenue (Gas)	\$1,033,184	\$743,919	\$1,033,184	\$1,033,184	\$1,033,184	\$1,545,891
Total	\$158,334,675	\$154,811,081	\$158,334,675	\$158,334,675	\$158,334,675	\$161,070,883
Net Fuel Lost Revenue (Electric)	\$157,301,490	\$154,067,162	\$157,301,490	\$157,301,490	\$157,301,490	\$159,524,992
Net Fuel Lost Revenue (Gas)	\$400,358	\$374,327	\$400,358	\$400,358	\$400,358	\$422,939
Total	\$157,701,848	\$154,441,489	\$157,701,848	\$157,701,848	\$157,701,848	\$159,947,931
Societal Test						
Avoided Electric Production	\$116,505,022	\$57,953,853	\$116,505,022	\$128,153,647	\$108,457,938	\$323,605,071
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250	\$85,047,250
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$567,400	\$152,694	\$567,400	\$611,869	\$530,062	\$2,315,439
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$202,119,672	\$143,153,797	\$202,119,672	\$213,812,766	\$194,035,250	\$410,967,760
Administration Costs	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301	\$909,301
Implementation / Participation Costs	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647	\$5,591,647
Other / Miscellaneous Costs	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654	\$39,654
Total	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602	\$6,540,602
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535	\$21,302,535
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870	\$5,767,870
Participant Costs (gross)	\$26,462,776	\$26,462,776	\$26,462,776	\$26,462,776	\$26,462,776	\$26,462,776
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$193,180,246	\$189,183,831	\$193,180,246	\$193,180,246	\$193,180,246	\$195,928,255
Participant Bill Savings (Gas) (gross)	\$1,033,184	\$743,919	\$1,033,184	\$1,033,184	\$1,033,184	\$1,545,891
Total	\$194,213,430	\$189,927,750	\$194,213,430	\$194,213,430	\$194,213,430	\$197,474,146

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	2.52	1.46	2.52	2.68	2.39	6.59
TRC Test	1.93	1.12	1.93	2.05	1.83	5.05
RIM Test	0.68	0.45	0.68	0.72	0.64	1.53
RIM (Net Fuel)	0.80	0.49	0.80	0.85	0.76	1.99
Societal Test	1.93	1.12	1.93	2.05	1.83	5.05
Participant Test	6.50	5.49	6.50	6.50	6.50	7.85

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$10,887,586	\$5,806,120	\$10,887,586	\$11,856,759	\$10,166,384	\$29,295,532
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,963,185	\$1,245,173	\$4,963,185	\$5,356,351	\$4,637,312	\$20,397,461
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$20,939,260	\$12,139,783	\$20,939,260	\$22,301,599	\$19,892,185	\$54,781,482
Administration Costs	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397
Implementation / Participation Costs	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689
Total	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$10,887,586	\$5,806,120	\$10,887,586	\$11,856,759	\$10,166,384	\$29,295,532
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,963,185	\$1,245,173	\$4,963,185	\$5,356,351	\$4,637,312	\$20,397,461
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$20,939,260	\$12,139,783	\$20,939,260	\$22,301,599	\$19,892,185	\$54,781,482
Administration Costs	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397
Implementation / Participation Costs	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$10,887,586	\$5,806,120	\$10,887,586	\$11,856,759	\$10,166,384	\$29,295,532
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,963,185	\$1,245,173	\$4,963,185	\$5,356,351	\$4,637,312	\$20,397,461
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$20,939,260	\$12,139,783	\$20,939,260	\$22,301,599	\$19,892,185	\$54,781,482
Administration Costs	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397
Implementation / Participation Costs	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689
Total	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071	\$8,311,071
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$14,292,489	\$13,481,062	\$14,292,489	\$14,292,489	\$14,292,489	\$15,195,539
Lost Revenue (Gas)	\$8,242,402	\$5,387,494	\$8,242,402	\$8,242,402	\$8,242,402	\$12,251,961
Total	\$22,534,891	\$18,868,556	\$22,534,891	\$22,534,891	\$22,534,891	\$27,447,499
Net Fuel Lost Revenue (Electric)	\$14,292,489	\$13,481,062	\$14,292,489	\$14,292,489	\$14,292,489	\$15,195,539
Net Fuel Lost Revenue (Gas)	\$3,490,121	\$2,883,762	\$3,490,121	\$3,490,121	\$3,490,121	\$3,991,397
Total	\$17,782,609	\$16,364,824	\$17,782,609	\$17,782,609	\$17,782,609	\$19,186,936
Societal Test						
Avoided Electric Production	\$10,887,586	\$5,806,120	\$10,887,586	\$11,856,759	\$10,166,384	\$29,295,532
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489	\$5,088,489
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,963,185	\$1,245,173	\$4,963,185	\$5,356,351	\$4,637,312	\$20,397,461
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$20,939,260	\$12,139,783	\$20,939,260	\$22,301,599	\$19,892,185	\$54,781,482
Administration Costs	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397	\$2,408,397
Implementation / Participation Costs	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985	\$4,811,985
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381	\$7,220,381
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689	\$1,090,689
Participant Costs (gross)	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631	\$3,635,631
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$14,292,489	\$13,481,062	\$14,292,489	\$14,292,489	\$14,292,489	\$15,195,539
Participant Bill Savings (Gas) (gross)	\$8,242,402	\$5,387,494	\$8,242,402	\$8,242,402	\$8,242,402	\$12,251,961
Total	\$22,534,891	\$18,868,556	\$22,534,891	\$22,534,891	\$22,534,891	\$27,447,499

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	1.64	1.64	1.64	1.64	1.64	1.64
TRC Test	2.27	2.27	2.27	2.27	2.27	2.27
RIM Test	0.86	0.86	0.86	0.86	0.86	0.85
RIM (Net Fuel)	0.86	0.86	0.86	0.86	0.86	0.85
Societal Test	2.27	2.27	2.27	2.27	2.27	2.27
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Administration Costs	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490
Implementation / Participation Costs	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658
Other / Miscellaneous Costs	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895
Incentives	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921
Total	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Administration Costs	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490
Implementation / Participation Costs	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658
Other / Miscellaneous Costs	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895
Total	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Ad ders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Administration Costs	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490
Implementation / Participation Costs	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658
Other / Miscellaneous Costs	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895
Incentives	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921
Total	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965	\$6,077,965
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338
Net Fuel Lost Revenue (Electric)	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338
Societal Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Ad ders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048	\$9,943,048
Administration Costs	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490	\$249,490
Implementation / Participation Costs	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658	\$4,048,658
Other / Miscellaneous Costs	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895	\$83,895
Total	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043	\$4,382,043
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921	\$1,695,921
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$5,526,006	\$5,423,294	\$5,526,006	\$5,526,006	\$5,526,006	\$5,617,338

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	1.47	1.22	1.47	1.51	1.44	2.34
TRC Test	2.95	2.45	2.95	3.03	2.90	4.71
RIM Test	1.02	0.91	1.02	1.05	1.00	1.50
RIM (Net Fuel)	1.12	0.96	1.12	1.15	1.10	1.74
Societal Test	2.95	2.45	2.95	3.03	2.90	4.71
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$11,604,968	\$4,353,385	\$11,604,968	\$12,995,139	\$10,680,438	\$33,885,204
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$6,972,161	\$1,695,982	\$6,972,161	\$7,526,451	\$6,511,502	\$28,609,100
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$73,759,315	\$61,231,553	\$73,759,315	\$75,703,777	\$72,374,126	\$117,676,490
Administration Costs	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109
Implementation / Participation Costs	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479
Other / Miscellaneous Costs	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258
Incentives	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949
Total	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$11,604,968	\$4,353,385	\$11,604,968	\$12,995,139	\$10,680,438	\$33,885,204
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$6,972,161	\$1,695,982	\$6,972,161	\$7,526,451	\$6,511,502	\$28,609,100
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$73,759,315	\$61,231,553	\$73,759,315	\$75,703,777	\$72,374,126	\$117,676,490
Administration Costs	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109
Implementation / Participation Costs	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479
Other / Miscellaneous Costs	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258
Total	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$11,604,968	\$4,353,385	\$11,604,968	\$12,995,139	\$10,680,438	\$33,885,204
Avoided Electric Production Advers	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$6,972,161	\$1,695,982	\$6,972,161	\$7,526,451	\$6,511,502	\$28,609,100
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$73,759,315	\$61,231,553	\$73,759,315	\$75,703,777	\$72,374,126	\$117,676,490
Administration Costs	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109
Implementation / Participation Costs	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479
Other / Miscellaneous Costs	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258
Incentives	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949
Total	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796	\$50,293,796
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$10,874,517	\$10,138,487	\$10,874,517	\$10,874,517	\$10,874,517	\$11,962,106
Lost Revenue (Gas)	\$11,016,977	\$6,800,018	\$11,016,977	\$11,016,977	\$11,016,977	\$16,372,160
Total	\$21,891,493	\$16,938,505	\$21,891,493	\$21,891,493	\$21,891,493	\$28,334,266
Net Fuel Lost Revenue (Electric)	\$10,874,517	\$10,138,487	\$10,874,517	\$10,874,517	\$10,874,517	\$11,962,106
Net Fuel Lost Revenue (Gas)	\$4,435,961	\$3,423,823	\$4,435,961	\$4,435,961	\$4,435,961	\$5,200,718
Total	\$15,310,478	\$13,562,311	\$15,310,478	\$15,310,478	\$15,310,478	\$17,162,824
Societal Test						
Avoided Electric Production	\$11,604,968	\$4,353,385	\$11,604,968	\$12,995,139	\$10,680,438	\$33,885,204
Avoided Electric Production Advers	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186	\$55,182,186
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$6,972,161	\$1,695,982	\$6,972,161	\$7,526,451	\$6,511,502	\$28,609,100
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$73,759,315	\$61,231,553	\$73,759,315	\$75,703,777	\$72,374,126	\$117,676,490
Administration Costs	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109	\$3,896,109
Implementation / Participation Costs	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479	\$13,001,479
Other / Miscellaneous Costs	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258	\$8,095,258
Total	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847	\$24,992,847
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949	\$25,300,949
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$10,874,517	\$10,138,487	\$10,874,517	\$10,874,517	\$10,874,517	\$11,962,106
Participant Bill Savings (Gas) (gross)	\$11,016,977	\$6,800,018	\$11,016,977	\$11,016,977	\$11,016,977	\$16,372,160
Total	\$21,891,493	\$16,938,505	\$21,891,493	\$21,891,493	\$21,891,493	\$28,334,266

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	3.07	1.93	3.07	3.27	2.93	7.37
TRC Test	3.07	1.93	3.07	3.27	2.93	7.37
RIM Test	0.74	0.51	0.74	0.78	0.70	1.57
RIM (Net Fuel)	0.81	0.54	0.81	0.86	0.77	1.83
Societal Test	3.07	1.93	3.07	3.27	2.93	7.37
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$22,152,908	\$11,569,501	\$22,152,908	\$24,170,040	\$20,666,205	\$60,359,792
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,695,902	\$1,178,117	\$4,695,902	\$5,067,895	\$4,387,578	\$19,298,994
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$37,819,091	\$23,717,899	\$37,819,091	\$40,208,217	\$36,024,065	\$90,629,067
Administration Costs	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907
Implementation / Participation Costs	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$22,152,908	\$11,569,501	\$22,152,908	\$24,170,040	\$20,666,205	\$60,359,792
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,695,902	\$1,178,117	\$4,695,902	\$5,067,895	\$4,387,578	\$19,298,994
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$37,819,091	\$23,717,899	\$37,819,091	\$40,208,217	\$36,024,065	\$90,629,067
Administration Costs	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907
Implementation / Participation Costs	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$22,152,908	\$11,569,501	\$22,152,908	\$24,170,040	\$20,666,205	\$60,359,792
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,695,902	\$1,178,117	\$4,695,902	\$5,067,895	\$4,387,578	\$19,298,994
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$37,819,091	\$23,717,899	\$37,819,091	\$40,208,217	\$36,024,065	\$90,629,067
Administration Costs	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907
Implementation / Participation Costs	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$30,374,004	\$28,427,843	\$30,374,004	\$30,374,004	\$30,374,004	\$32,578,968
Lost Revenue (Gas)	\$8,647,323	\$5,652,163	\$8,647,323	\$8,647,323	\$8,647,323	\$12,853,857
Total	\$39,021,326	\$34,080,006	\$39,021,326	\$39,021,326	\$39,021,326	\$45,432,825
Net Fuel Lost Revenue (Electric)	\$30,374,004	\$28,427,843	\$30,374,004	\$30,374,004	\$30,374,004	\$32,578,968
Net Fuel Lost Revenue (Gas)	\$4,089,490	\$3,379,000	\$4,089,490	\$4,089,490	\$4,089,490	\$4,676,853
Total	\$34,463,494	\$31,806,843	\$34,463,494	\$34,463,494	\$34,463,494	\$37,255,821
Societal Test						
Avoided Electric Production	\$22,152,908	\$11,569,501	\$22,152,908	\$24,170,040	\$20,666,205	\$60,359,792
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282	\$10,970,282
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$4,695,902	\$1,178,117	\$4,695,902	\$5,067,895	\$4,387,578	\$19,298,994
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$37,819,091	\$23,717,899	\$37,819,091	\$40,208,217	\$36,024,065	\$90,629,067
Administration Costs	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907	\$499,907
Implementation / Participation Costs	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136	\$11,805,136
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042	\$12,305,042
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$30,374,004	\$28,427,843	\$30,374,004	\$30,374,004	\$30,374,004	\$32,578,968
Participant Bill Savings (Gas) (gross)	\$8,647,323	\$5,652,163	\$8,647,323	\$8,647,323	\$8,647,323	\$12,853,857
Total	\$39,021,326	\$34,080,006	\$39,021,326	\$39,021,326	\$39,021,326	\$45,432,825

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	2.57	1.01	2.57	2.78	2.41	8.52
TRC Test	2.57	1.01	2.57	2.78	2.41	8.52
RIM Test	0.60	0.30	0.60	0.65	0.56	1.59
RIM (Net Fuel)	0.84	0.36	0.84	0.91	0.78	2.57
Societal Test	2.57	1.01	2.57	2.78	2.41	8.52
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$25,378,624	\$11,804,947	\$25,378,624	\$27,927,992	\$23,612,037	\$70,674,593
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$29,355,902	\$7,140,840	\$29,355,902	\$31,689,713	\$27,416,323	\$120,457,057
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$58,956,402	\$23,167,663	\$58,956,402	\$63,839,581	\$55,250,236	\$195,353,525
Administration Costs	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784
Implementation / Participation Costs	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834
Other / Miscellaneous Costs	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$25,378,624	\$11,804,947	\$25,378,624	\$27,927,992	\$23,612,037	\$70,674,593
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$29,355,902	\$7,140,840	\$29,355,902	\$31,689,713	\$27,416,323	\$120,457,057
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$58,956,402	\$23,167,663	\$58,956,402	\$63,839,581	\$55,250,236	\$195,353,525
Administration Costs	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784
Implementation / Participation Costs	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834
Other / Miscellaneous Costs	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909
Total	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$25,378,624	\$11,804,947	\$25,378,624	\$27,927,992	\$23,612,037	\$70,674,593
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$29,355,902	\$7,140,840	\$29,355,902	\$31,689,713	\$27,416,323	\$120,457,057
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$58,956,402	\$23,167,663	\$58,956,402	\$63,839,581	\$55,250,236	\$195,353,525
Administration Costs	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784
Implementation / Participation Costs	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834
Other / Miscellaneous Costs	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$28,997,008	\$26,912,074	\$28,997,008	\$28,997,008	\$28,997,008	\$31,452,702
Lost Revenue (Gas)	\$46,196,310	\$28,513,787	\$46,196,310	\$46,196,310	\$46,196,310	\$68,651,627
Total	\$75,193,318	\$55,425,861	\$75,193,318	\$75,193,318	\$75,193,318	\$100,104,329
Net Fuel Lost Revenue (Electric)	\$28,997,008	\$26,912,074	\$28,997,008	\$28,997,008	\$28,997,008	\$31,452,702
Net Fuel Lost Revenue (Gas)	\$18,513,964	\$14,289,696	\$18,513,964	\$18,513,964	\$18,513,964	\$21,705,760
Total	\$47,510,972	\$41,201,770	\$47,510,972	\$47,510,972	\$47,510,972	\$53,158,462
Societal Test						
Avoided Electric Production	\$25,378,624	\$11,804,947	\$25,378,624	\$27,927,992	\$23,612,037	\$70,674,593
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876	\$4,221,876
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$29,355,902	\$7,140,840	\$29,355,902	\$31,689,713	\$27,416,323	\$120,457,057
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$58,956,402	\$23,167,663	\$58,956,402	\$63,839,581	\$55,250,236	\$195,353,525
Administration Costs	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784	\$1,024,784
Implementation / Participation Costs	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834	\$21,390,834
Other / Miscellaneous Costs	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909	\$509,909
Total	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527	\$22,925,527
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$28,997,008	\$26,912,074	\$28,997,008	\$28,997,008	\$28,997,008	\$31,452,702
Participant Bill Savings (Gas) (gross)	\$46,196,310	\$28,513,787	\$46,196,310	\$46,196,310	\$46,196,310	\$68,651,627
Total	\$75,193,318	\$55,425,861	\$75,193,318	\$75,193,318	\$75,193,318	\$100,104,329

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	4.53	3.04	4.53	4.83	4.30	9.89
TRC Test	2.37	1.59	2.37	2.53	2.25	5.18
RIM Test	0.81	0.55	0.81	0.87	0.77	1.74
RIM (Net Fuel)	0.81	0.55	0.81	0.87	0.77	1.74
Societal Test	2.37	1.59	2.37	2.53	2.25	5.18
Participant Test	3.20	3.14	3.20	3.20	3.20	3.27

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$50,751,743	\$28,590,220	\$50,751,743	\$55,264,632	\$47,395,656	\$130,735,157
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$67,585,207	\$45,423,683	\$67,585,207	\$72,098,095	\$64,229,120	\$147,568,620
Administration Costs	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833
Implementation / Participation Costs	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072
Other / Miscellaneous Costs	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884
Incentives	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862
Total	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$50,751,743	\$28,590,220	\$50,751,743	\$55,264,632	\$47,395,656	\$130,735,157
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$67,585,207	\$45,423,683	\$67,585,207	\$72,098,095	\$64,229,120	\$147,568,620
Administration Costs	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833
Implementation / Participation Costs	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072
Other / Miscellaneous Costs	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884
Total	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$50,751,743	\$28,590,220	\$50,751,743	\$55,264,632	\$47,395,656	\$130,735,157
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$67,585,207	\$45,423,683	\$67,585,207	\$72,098,095	\$64,229,120	\$147,568,620
Administration Costs	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833
Implementation / Participation Costs	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072
Other / Miscellaneous Costs	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884
Incentives	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862
Total	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652	\$14,924,652
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$68,260,744	\$66,957,390	\$68,260,744	\$68,260,744	\$68,260,744	\$69,897,232
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$68,260,744	\$66,957,390	\$68,260,744	\$68,260,744	\$68,260,744	\$69,897,232
Net Fuel Lost Revenue (Electric)	\$68,260,744	\$66,957,390	\$68,260,744	\$68,260,744	\$68,260,744	\$69,897,232
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$68,260,744	\$66,957,390	\$68,260,744	\$68,260,744	\$68,260,744	\$69,897,232
Societal Test						
Avoided Electric Production	\$50,751,743	\$28,590,220	\$50,751,743	\$55,264,632	\$47,395,656	\$130,735,157
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463	\$16,833,463
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$67,585,207	\$45,423,683	\$67,585,207	\$72,098,095	\$64,229,120	\$147,568,620
Administration Costs	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833	\$744,833
Implementation / Participation Costs	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072	\$3,252,072
Other / Miscellaneous Costs	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884	\$255,884
Total	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789	\$4,252,789
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921	\$24,230,921
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862	\$10,671,862
Participant Costs (gross)	\$27,634,285	\$27,634,285	\$27,634,285	\$27,634,285	\$27,634,285	\$27,634,285
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$77,643,953	\$76,068,259	\$77,643,953	\$77,643,953	\$77,643,953	\$79,622,455
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$77,643,953	\$76,068,259	\$77,643,953	\$77,643,953	\$77,643,953	\$79,622,455

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	1.86	1.33	1.86	1.97	1.77	4.02
TRC Test	2.26	1.62	2.26	2.39	2.15	4.88
RIM Test	0.56	0.40	0.56	0.59	0.53	1.21
RIM (Net Fuel)	0.56	0.40	0.56	0.59	0.53	1.21
Societal Test	2.26	1.62	2.26	2.39	2.15	4.88
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$11,318,812	\$7,296,071	\$11,318,812	\$12,183,643	\$10,630,959	\$27,908,929
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$14,267,223	\$10,244,482	\$14,267,223	\$15,132,054	\$13,579,370	\$30,857,340
Administration Costs	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202
Implementation / Participation Costs	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421
Total	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$11,318,812	\$7,296,071	\$11,318,812	\$12,183,643	\$10,630,959	\$27,908,929
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$14,267,223	\$10,244,482	\$14,267,223	\$15,132,054	\$13,579,370	\$30,857,340
Administration Costs	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202
Implementation / Participation Costs	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$11,318,812	\$7,296,071	\$11,318,812	\$12,183,643	\$10,630,959	\$27,908,929
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$14,267,223	\$10,244,482	\$14,267,223	\$15,132,054	\$13,579,370	\$30,857,340
Administration Costs	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202
Implementation / Participation Costs	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Incentives	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421
Total	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112	\$7,677,112
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014
Net Fuel Lost Revenue (Electric)	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014
Societal Test						
Avoided Electric Production	\$11,318,812	\$7,296,071	\$11,318,812	\$12,183,643	\$10,630,959	\$27,908,929
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411	\$2,948,411
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$14,267,223	\$10,244,482	\$14,267,223	\$15,132,054	\$13,579,370	\$30,857,340
Administration Costs	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202	\$1,598,202
Implementation / Participation Costs	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489	\$4,721,489
Other / Miscellaneous Costs	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691	\$6,319,691
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421	\$1,357,421
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$17,766,164	\$17,754,372	\$17,766,164	\$17,766,164	\$17,766,164	\$17,803,014

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	0.00	0.00	0.00	0.00	0.00	0.00
TRC Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM (Net Fuel)	0.00	0.00	0.00	0.00	0.00	0.00
Societal Test	0.00	0.00	0.00	0.00	0.00	0.00
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Societal Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	0.00	0.00	0.00	0.00	0.00	0.00
TRC Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM (Net Fuel)	0.00	0.00	0.00	0.00	0.00	0.00
Societal Test	0.00	0.00	0.00	0.00	0.00	0.00
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Societal Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223	\$1,927,223
Implementation / Participation Costs	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851	\$50,851
Other / Miscellaneous Costs	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818	\$644,818
Total	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892	\$2,622,892
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	0.00	0.00	0.00	0.00	0.00	0.00
TRC Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM (Net Fuel)	0.00	0.00	0.00	0.00	0.00	0.00
Societal Test	0.00	0.00	0.00	0.00	0.00	0.00
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855
Implementation / Participation Costs	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364
Other / Miscellaneous Costs	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855
Implementation / Participation Costs	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364
Other / Miscellaneous Costs	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085
Total	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855
Implementation / Participation Costs	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364
Other / Miscellaneous Costs	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Societal Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855	\$194,855
Implementation / Participation Costs	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364	\$4,324,364
Other / Miscellaneous Costs	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085	\$12,085
Total	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304	\$4,531,304
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0

Cost / Benefit Tests For Normal Weather						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test	0.00	0.00	0.00	0.00	0.00	0.00
TRC Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM Test	0.00	0.00	0.00	0.00	0.00	0.00
RIM (Net Fuel)	0.00	0.00	0.00	0.00	0.00	0.00
Societal Test	0.00	0.00	0.00	0.00	0.00	0.00
Participant Test	65535	65535	65535	65535	65535	65535

Present Values (PVs) of Costs and Benefits Per Test						
	Cost Based	Market-Based				
		Minimum	Today	Alternate	Option	Maximum
Utility (PAC) Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658
Implementation / Participation Costs	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185
Other / Miscellaneous Costs	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
TRC Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658
Implementation / Participation Costs	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185
Other / Miscellaneous Costs	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198
Total	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (net)	\$0	\$0	\$0	\$0	\$0	\$0

RIM Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658
Implementation / Participation Costs	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185
Other / Miscellaneous Costs	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Electric)	\$0	\$0	\$0	\$0	\$0	\$0
Net Fuel Lost Revenue (Gas)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Societal Test						
Avoided Electric Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Production Adders	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Electric Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Avoided T&D Electric	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Ancillary	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Production	\$0	\$0	\$0	\$0	\$0	\$0
Avoided Gas Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Administration Costs	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658	\$454,658
Implementation / Participation Costs	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185	\$10,090,185
Other / Miscellaneous Costs	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198	\$28,198
Total	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041	\$10,573,041
Reduced Arrears	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (net)	\$0	\$0	\$0	\$0	\$0	\$0
Environmental Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Other Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0
Participant Test						
Incentives	\$0	\$0	\$0	\$0	\$0	\$0
Participant Costs (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Tax Credits (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Electric) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Participant Bill Savings (Gas) (gross)	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0

**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

**Energy Efficiency DSM Advisory Group
Participant Sign-in Sheet and Meeting Record
December 12, 2012**

Appendix D

MEETING RECORD
Energy Efficiency Advisory Group Meeting

Date: **December 12, 2012**

Participants: **LG&E /KU:**
David Huff, Director Customer Energy Efficiency Smart Grid Strategy
Allyson Sturgeon, Senior Corporate Attorney
Michael Hornung, Manager Energy Efficiency Planning & Development
Lisa Keels, Manager Energy Efficiency Operations
Tim Melton, Manager Customer Commitment
Kelly Ann Couch, Program Manager
Kevin Craft, Energy Efficiency Program R&D Analyst
John Hayden, Program Manager
Jason Knoy, Program Manager

Constituency:
Sherman Adams, Shelby County Schools
Jack Burch, Community Action Council
Lee Colton, Governor's Office of Energy Policy
Brent Fryrear, Partnership for a Green City
Linda Hampton, Lexington Community Action Council
Cathy Hinko, Metro Housing Coalition
Andrew Isaacs, Kentucky Housing Corporation
Michelle King, Louisville Metro Air Pollution Control District
Charlie Lanter, Lexington Community Action Council
Cynthia Lee, Louisville Metro Air Pollution Control District
Nina McCormack, Beyond Possibility
Ron Willhite, Kentucky School Board Association
Sam Williams, Midwest Energy Efficiency Alliance

Date Issued: 01/07/13_Draft for Review

Issued by: Kelly Ann Couch

The following meeting minutes have been prepared by Kelly Ann Couch to summarize the conversations and issues discussed at the above referenced meeting. All Attendees listed above should review these minutes, and if there are any errors, omissions, or additions, kindly submit them for inclusion.

Welcome and Introductions

- D. Huff welcomed the meeting participants. All meeting participants introduced themselves and indicated their company, agency or organization of affiliation.
- Discussion of the five (5) programs ending in 2014.
 - These programs include: AC Test and Tune Up; Dealer Referral Network; Energy Saving New Homes; Residential High Efficiency Lighting; and Customer Education and Public Information.
- Request for input on potential next steps for DSM/EE programming to take the place of the programs that are ending.

Settlement Agreement

- D. Huff provided participants with an update on upcoming and rate case settlement filing with the Commission. Filing effort will be to support the Kentucky School Board Association's continuance of school energy managers in the LG&E and KU service territory.

Energy Efficiency Market Potential Study

- M. Hornung provided an overview and rationale for the Company pursuing an Energy Efficiency Market Potential Study.
 - Commission requested that the Company look to understand what the true market potential for Energy Efficiency is within the service territory through a market potential study.
 - The contracted potential study will look at utility data, surveys etc.
 - Completed report will be received in Q3 of 2013. It is anticipated that the results will be shared with the DSM Advisory Group.
 - Results of the market potential study, conversations of the DSM Advisory Group and customer impact data will be used to understand programs for future filing submissions.

2015 and Beyond

- D. Huff provided insight as to why the Company is looking to receive input in 2012 regarding the DSM/EE programming when current programming is not slated to end until 2014.
 - The impetus for early discussions is to ensure that programs that are presented to the KPSC for approval have ample time to go through the regulatory review and approval process without break in services to the residential/commercial customer segment.
 - Every month delay in the approval process presents a larger gap in customer service.

Group Discussion

- D. Huff and M. Hornung opened the floor to questions, comments, suggestions and areas for consideration relating to future programming for analysis. To guide the conversation three questions were presented. (1) Where should the next Energy Efficiency/DSM programs come from? (2) Where can additional energy savings be garnered? (3) Potential concepts for further utility analysis?
- The following is a summary of the general questions asked by the Energy Efficiency Advisory Group participants.

Q: Are the programs that will be ending in 2014 included in the same billing surcharge?

A: Yes

Q: Why are programs expiring?

A: The programs were approved by the KPSC for a 7 year time frame. The 7 year period allows for the Company to launch; run programming; learn from program performance and analysis; and the reassess the need for the program or potential areas of redesign.

Q: Will Cadmus (the 3rd party vendor for the Market Potential Study) be able to recommend programming to include in the next filing?

A: The data and analysis provided by Cadmus will be taken as a data point along with conversations with the DSM Advisory Group and customer impact data to understand programs for future filing submissions.

Q: Will the Market Potential Study provide data on both existing programming as well as new?

A: Yes, the data will look at current programming to understand if there is additional potential.

Q: Will there be opportunity for Industrial Customers to participate in future programming?

A: The Company completed a survey with its Industrial Customer segment. The results were inconclusive.

Many respondents stated that if a program was available to them and it was “economic” for them to participate, they would. From the utility perspective, if a program is approved and it is not viewed as economical from the view point of the Industrial Customer the utility’s economics fall apart. Therefore, at this time, the Company is not looking to pursue Industrial customer programming.

Q: Will special research be conducted on how monies are charged where multi-family programming is concerned?

A: Multi-family dwellings are accounted for in program participation rates.

Q: Has the Smart Energy Profile allowed the Company to go to a new level of granularity of customer data?

A: The data that the Company has is usage for load forecasting. The Company has contracted with a 3rd party vendor for demographic data. The Company does not own the PVA data, it is proprietary information.

Q: Is there any geographic information available?

A: No. The Company does not do geographic segmentation of our data. Currently, the Company is working with our internal Marketing group to better understand our customers.

Q: Has there been any effort to connect with the Sustainable Energy Group?

A: Yes, conversations are taking place with this group.

Q: I have ~20 CFLs in storage (CFLs received through the Company Residential Lighting Program). Has analysis been completed on LEDs?

A: We are currently looking at price points and completing analysis internally.

Q: How is marketing accounted for in programming dollars?

A: Market research is completed during the program development process. The Company looks at other mid-west / like utilities that have been successful with similar programming; use of best practices etc. These primary efforts ensure that the dollars targeted for programming are specific to the need of participant engagement.

Q: Are there policy barriers to renewable energy sources?

A: As a regulated utility, the Company is charged with reliable, safe and least cost to the customer. Renewable energy at this point presents a challenge in these areas. However, the Company continues to look at technologies to support customers in their energy efficiency efforts.

Q: Are Commercial Rebates available for cool or green roof programs?

A: These efforts are currently available for rebates under our current Commercial Rebate model.

Q: Are there requirements for energy efficiency programming to be the same among each utility i.e. does the programming offered to LG&E customers be the same as that offered to KU customers?

A: There is not at statute. However, there are operational efficiencies when the same program is offered to both utilities.

Q: Are programs ever looked at from a cost per kilowatt perspective?

A: Yes. All programs are looked at from a supply side model.

Q: Are their financing opportunities available for customers?

A: Not through the utility; however, pieces are available through current partnerships.

- The following is a summary of potential programming for analysis provided by the Energy Efficiency Advisory Group participants.

- Weatherization of senior citizen high rise buildings.
- Refrigerator replacement for Tier I and Tier II WeCare customers.
- Untethered dollars for special energy efficiency efforts.
- Rehab of non-profit sector buildings who get heavy use by the residential customer segment.
- Tree planting rebating
- Rebating for solar hot water heaters.
- Thermostats

Closing

- D. Huff closed the meeting with thanking participants for their attendance, continued support and discussion.
- M. Hornung further commented that the DSM Advisory Group should not be the only time the members talk and discuss issues. If questions, comments or issues arise regarding programming, the Group members need not hesitate to reach out.

Additional comments for follow up:

1. Is there an opportunity to have a document sent to meeting participants that outlines the current portfolio of programs with information on those that will be ending in 2014?
 - a. Yes, a document will be sent to meeting participants for reference.



Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
Wednesday, December 12, 2012
Fairfield Inn & Suites
2:00p – 4:00p

Name	Organization	Phone	E-Mail
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Cynthia Lee	LMAPOD	502.574.7217	cynthia.lee@louisvilleky.gov
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Kevin Craft	LGE/KU	502-627-2397	kevin.craft@lge-ku.com
Allyson Sturgeon	LGE/KU	502 627-2088	allyson.sturgeon@lge-ku.com
John P. Malloy	LKE	502 627-4836	—
Andrew Isaacs	RHC	859-227-8149	aissaac@kyhousing.org



Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
Wednesday, December 12, 2012
Fairfield Inn & Suites
2:00p – 4:00p

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JACK BURCH	Community Action Council	" " "	jack.burch@commaction.org
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**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

**Energy Efficiency DSM Advisory Group
Participant Sign-in Sheet and Meeting Record
June 26, 2013**

Appendix E

MEETING RECORD
Energy Efficiency Advisory Group Meeting

Date: **June 26, 2013**

Participants: **LG&E /KU:**
David Huff, Director Customer Energy Efficiency Smart Grid Strategy
Allyson Sturgeon, Senior Corporate Attorney
Michael Hornung, Manager Energy Efficiency Planning & Development
Lisa Keels, Manager Energy Efficiency Operations
Rick Lovekamp, Manager Regulatory Affairs
Kelly Ann Couch, Program Manager
Kevin Craft, Energy Efficiency Program R&D Analyst
John Hayden, Program Manager
Jason Knoy, Program Manager
Janet Wickline, Customer Relations Specialist

Constituency:
Russell Barnett, University of Louisville
Lee Colton, Governor's Office of Energy Policy
Tyler Cvitkovic, Kentucky NEED Project
Allen Dittmer, Partnership for a Green City
Brent Fryrear, Partnership for a Green City
Cathy Hinko, Metro Housing Coalition
Lisa Kilkelly, Legal Aid
Michelle King, Louisville Metro Air Pollution Control District
Cynthia Lee, Louisville Metro Air Pollution Control District
Mike Mulheirn, Jefferson County Public Schools
John Nipple, Kentucky School Board Association
Lora Werner, Kentucky Home Builders Association

Date Issued: 06/27/13_Draft for Review

Issued by: Kelly Ann Couch

The following meeting minutes have been prepared by Kelly Ann Couch to summarize the conversations and issues discussed at the above referenced meeting. All Attendees listed above should review these minutes, and if there are any errors, omissions, or additions, kindly submit them for inclusion.

Welcome and Introductions

- D. Huff welcomed the meeting participants. All meeting participants introduced themselves and indicated their company, agency, or organization of affiliation.
- D. Huff provided an overview of the following aspects:
 - Rationale for DSM programming by the utility
 - DSM filing and energy efficiency portfolio history
 - Rationale for beginning the development process in 2013 with programming no to begin until 2015
- D. Huff addressed programming concepts that were presented during the previous DSM Advisory Group meeting:

- T-Stat/NEST: The Company has a history with providing T-stats. Additionally, from a utility perspective, customers can change the temp on a T-stat making it difficult to calculate the true energy/demand savings.
- Tree Planting: Questions on how long it takes for the tree to mature, if it was planted in the appropriate place etc. Again, makes it difficult to calculate the true energy/demand savings.
- Rebates on Solar Water Heaters: Currently captured under the current rebate program offering.
- D. Huff reiterated for participants that during the last meeting attendees stated that they would like to see data associated with the 5 programs expiring. The session today will provide that information as well as provide an orientation session for future meeting sessions.

Programs Expiring and KPSC Filing Plans

- M. Hornung reiterated the goal of DSM programming as a means to delay new generation assets; DSM charges assessed for residential/commercial customer segment.
- M. Hornung provided a review of dollars spent, energy / demand savings from a portfolio level as well as an overview of each of the 5 programs expiring from the portfolio (Residential New Home Construction; Residential High Efficiency Lighting; Customer Education & Public Information; Residential/ Commercial HVAC Diagnostic & Tune Up; and Dealer Referral Network.
- M. Hornung shared with the members that the information provided is not firm, but an opportunity to discuss the Company's thoughts and get input from constituents.
- Commission requested that the Company look to understand what the true market potential for Energy Efficiency is within the service territory through a market potential study.
 - It is anticipated that the study results will be provided to the Group to review and a meeting scheduled with Cadmus to attend an Advisory Group meeting to walk through the completed report.
- M. Hornung provided an overview of programming that the Company is exploring for modification. The following is a brief overview:
 - Home Energy Rebates: Additional funds to allow for increase rebate opportunities for residential customers.
 - Commercial DLC: Removal of capital from the residential DLC program and add to the Commercial DLC program to support growth of the Small Commercial segment.
 - Commercial Energy Analysis / Rebates: Eliminate on-site audits; build a more robust online audit tool; and rebate for new construction efforts.
 - Residential Audit/ Home Performance: Implement a tier structure for multi-family properties.
 - Customer Education and Public Information: Continue efforts to enhance customer awareness of energy efficiency; expand school based programming into grades 9-12; and extend programming to 2018.

Timing of Additional Meetings

- Participants were asked for their support and willingness to participate in more than the historical 2 meetings per year to continue dialogue on program development efforts.
- The next meeting will be regarding the Potential Study conducted by Cadmus.

Group Questions / Comments

- The following is a summary of the general questions asked by the Energy Efficiency Advisory Group participants.

Q: Are LG&E/ KU looking at impacts on protected classes?

A: LG&E/ KU do not look at special or protected classes. The Company looks at programs to reduce energy/demand for the residential and commercial customer segments.

Q: Do customers who pay online get the same information that is provided to customers who receive a paper bill?

A: Yes.

Q: What has made the difference in success between the Commercial DLC program and the AC Test and Tune Up Program?

A: The AC Test and Tune Up Program put the Company in a competitive market where there is a strong business culture with HVAC contractors/businesses. With the Commercial DLC program the partnership developed with our business partner EnerNOC allows the Company to take advantage of national chain relationships that ensure successful high energy and demand reductions from Companies such as Wal-Mart, Target, school districts etc.

Q: Has the LG&E/KU ever looked at Building Commissioning?

A: The ideas that have been presented at the meeting are just initial thoughts. The Company can look at other possibilities.

Q: Has there been any additional exploration on additional Smart Meter Pilots?

A: At this time, there are no plans to roll out smart meters. Currently the Company is looking at 3rd party validation of the decision not to move forward to ensure that there was nothing missed in our internal analysis. We will continue to monitor this effort and implement at the speed of value to the customer.

Q: From a customer education standpoint, there are a lot of applications in the market place. Is it possible to have something in place for customers that lets them be aware of high energy usage times (i.e. “this is a high energy alert”)?

A: That type of effort could possibly be captured under our current customer education and public information program model.

Q: Has the Company ever explored combined heat and power opportunities for Commercial Customers?

A: Yes, these types of opportunities are captured through custom rebates for commercial customers who have installed capacitor banks to manage peak load.

Closing

- D. Huff closed the meeting with thanking participants for their attendance, continued support, and discussion.
- M. Hornung further commented that the DSM Advisory Group should not be the only time the members talk and discuss issues. If questions, comments, or issues arise regarding programming, the Group members need not hesitate to reach out.



Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
 Wednesday, June 26, 2013
 Fairfield Inn & Suites
 2:00p – 4:00p

Name	Organization	Phone	E-Mail
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Brent Fryrear	Partnership for a Greater KY	502-852-8854	brent@partnershipforagreaterky.org
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Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
 Wednesday, June 26, 2013
 Fairfield Inn & Suites
 2:00p – 4:00p

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Michael Horvath	Lee/KU		



Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
 Wednesday, June 26, 2013
 Fairfield Inn & Suites
 2:00p – 4:00p

Name	Organization	Phone	E-Mail
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**Louisville Gas and Electric Company
and
Kentucky Utilities Company**

**Energy Efficiency DSM Advisory Group
Participant Sign-in Sheet and Meeting Record
October 29, 2013**

Appendix F

MEETING RECORD
Energy Efficiency Advisory Group Meeting

Date: **October 29, 2013**

Location: **Fairfield Inn & Suites**

Participants: **LG&E /KU:**
David Huff, Director Customer Energy Efficiency Smart Grid Strategy
Allyson Sturgeon, Senior Corporate Attorney
Michael Hornung, Manager Energy Efficiency Planning & Development
Lisa Keels, Manager Energy Efficiency Operations
Rick Lovekamp, Manager Regulatory Affairs
Tim Melton, Manager Customer Commitment
Kelly Ann Couch, Program Manager
Kevin Craft, Energy Efficiency Program R&D Analyst
John Hayden, Program Manager

Constituency:
Greg Guess, Department for Energy Development and Independence
Lee Colton, Department for Energy Development and Independence
Malcolm Ratchford, Community Action Council
Charlie Lanter, Community Action Council
Allen Dittmer, University of Louisville
Maria Koetter, Louisville Metro Government
Trent Burdick, Metro Housing Coalition
Eileen Ordovery, Legal Aid
Mike Mulheirn, Jefferson County Public Schools
John Nipple, Kentucky School Board Association
Ron Willhite, Kentucky School Board Association
Lora Werner, Kentucky Home Builders Association

Date Issued: 11/01/13_Draft for Review

Issued by: Kelly Ann Couch

The following meeting minutes have been prepared by Kelly Ann Couch to summarize the conversations and issues discussed at the above referenced meeting. All Attendees listed above should review these minutes, and if there are any errors, omissions, or additions, kindly submit them for inclusion.

Welcome
D. Huff welcomed the meeting participants. A brief discussion followed with the success of energy efficiency programming thus far and the Company's ability to attain ~300MW demand reduction through its programming since 2008.
Introductions and Meeting Agenda
M. Hornung welcomed meeting participants. All meeting participants introduced themselves and indicated their company, agency, or organization of affiliation.

M. Hornung provided an overview of the meeting agenda.

- Program history to date
- Potential Study results – The Cadmus Group
- Review of programs expiring
- KPSC filing plans

Program History to Date

M. Hornung provided an overview of the Company's energy efficiency programs successes since 2008.

- The shared Company data (financial, energy and demand savings) demonstrate a year over year success level of customer engagement and success.
- The year over year successes that the Companies have achieved is now beginning to be met with some contention due to the high levels of customer engagement and saturation rates of program participation within the service territory.
- Need identified to understand the true energy efficiency potential of the service territory.

Potential Study Results – The Cadmus Group

M. Hornung provided an overview of the preliminary results being seen for the Potential Study conducted by The Cadmus Group.

- The Study quantified the amount of energy and demand that could be saved in the service territory from 2014 to 2033. The Study looked at technical, economic and achievable potential.
- Study accounted for:
 - Known changes in codes and standards;
 - Technical feasibility and limitations;
 - Cost-effectiveness (economic potential);
 - Consumers' willingness to adopt measures
- The Study indicated that the low cost of the utility can make it challenging for energy efficiency programming in years to come.
- The Company will eventually reach a resistance level with program participation. The Company will deplete its energy efficiency potential in ~5 to 7 years.

Review of Programs Expiring

M. Hornung provided a brief review of programs that are going to expire from the energy efficiency portfolio at the close of 2014.

- Residential Lighting
- New Home Construction
- Dealer Referral Network
- AC Diagnostic and Tune Up
- Customer Education and Public Information

KPSC Filing Plans

M. Hornung provided an update regarding the program modifications that the Company was currently assessing to include in its 20145-2018 KPSC Filing Plans.

- Home Energy Rebates
 - The addition of \$5.7M over the 4 year plan to allow for increased rebate opportunities for the residential customer.
 - The additional funds will allow an additional 35,720MWh and 3MW over the 4 year plan.
- Commercial DLC
 - The addition of \$3.8M over the 4 year plan to implement customizable demand response options to large commercial customers.
 - The additional funds will allow an additional 17.7MW reduction over the 4 year plan.

- Commercial Energy Analysis
 - The proposed modification will eliminate on-site commercial audit; build a more robust online audit tool as well as rebate for new construction efforts.
 - The budgets will remain the same as in the 2011 filing as well as reduce its annual energy and demand savings.
- Residential Audit
 - The proposed modification will request the implementation of a tier structure for Multi-family properties as well as a tier structure for insulation and weatherization efforts.
 - The budgets will remain the same as in the 2011 filing as well maintain its annual energy and demand savings.
- Customer Education and Public Information
 - The proposed modification will request continuance of the customer education and public information program through school based programming; mass media efforts as well as implement training for new home construction professionals.
 - The budgets will reflect a 2% adjustment for inflation.

Approval Time Line

M. Hornung provided an update to the proposed KPSC filing timeline to meet the 10 month regulatory process.

- 2013 4th Quarter: Program development cycle
- 2014: 10 month regulatory process
- January 2015: Launch of the KPSC approved programs

Group Questions / Comments

The following is a summary of the general questions asked by the Energy Efficiency Advisory Group participants.

Q: Are customers surveyed regarding energy efficiency programs?

A: Yes, customers are surveyed through a coordinated effort via the Company's Marketing Department.

Q: What data was used by Cadmus in the Potential Study?

A: Cadmus used the generation models and costs associated with the utility. The Cadmus Group utilized the Company's models and inputs. They did not forecast their own assumptions.

Q: Is DSM used in the Integrated Resource Plan process?

A: The forecasted energy and demand savings that are captured through Demand Side Management programming is tied to the Company's demand and supply side planning process.

Q: With those customers are the highest energy users, what efforts are in place to support them?

A: There are several ways the Company supports the highest end user. Through the WeCare program, the Company provides weatherization and education services to its low-income segment and going forward in the 2015-2018 filing, there will be a multi-family tier in the residential audit program that will help support customers with poorer housing stock.

Q: Is there a price point in which customers will become more mindful of their energy use and its cost?

A: Yes and no, if the cost change is gradual then you are likely not to have such a significant reaction; however if there is a large and quick change, then the customer will typically become more conscious of spending choices.

Q: How does the results of the potential study impact program planning?

A: The potential study does indicate that we are rapidly depleting available energy efficiency potential in

the service territory. That said, the Company's will still continue to monitor the market and available energy efficiency technologies. As it relates to the 2015-2018 DSM/EE program plans, upon approval all of the entire portfolio will be in alignment to expire at the end of 2018. At that time, it will allow the Companies to understand market conditions at that time as well as available technology options.

Q: The education efforts that are being provided are they with customers or with schools?

A: The current educational efforts provided include a partnership with the National Energy Education Development Project to provide school based education efforts.

Q: Will there be any modifications to the WeCare program?

A: At this time no; however, internally from an operational perspective the program is looking to open up eligibility to customers to be sooner than every 3 years. In addition the Company is working with the Community Action of Kentucky to expand program delivery to make better use of resources.

Q: Has there been any discussion regarding programming for manufactured homes?

A: The Company recognizes there is value; however, we are looking to the EKPC for support and learnings as their footprint has a larger percentage of manufactured homes then the LG&E/KU service territory.

Q: PPL has a program where energy efficiency kits are provided to low income customers. Has this ever been a consideration for LG&E/KU?

A: PPL has energy efficiency regulatory requirements. The provision of kits may be a least cost solution for PPL to meet their requirement. At this time, LG&E/KU does not have those types of regulatory requirements. In addition, the Company needs to be certain that the measures that are deployed are actually being utilized from a supply side perspective. At this time deployment of energy efficiency kits are not a least cost option for the Company.

Q: Has consideration been given to PV, Geothermal or and type of renewable resource?

A: These technologies are continually monitored. As soon as the economics become more favorable, the Company can then look to support them. As an electric utility we think about renewables, customer experience, cost and future generation on a daily basis.

Closing

- M. Hornung closed the meeting with thanking participants for their attendance, continued support, and discussion. He further commented that the DSM Advisory Group should reach out with questions, comments, or issues regarding programming.



PPL companies

Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
Tuesday, October 29, 2013
Fairfield Inn & Suites
2:00p – 4:00p

Name	Organization	Phone	E-Mail
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Lora Werner	HBAK	800-489-4225	loraw@hbak.com
Allan Dottauer	UofL	384-8008	allan@louisville.edu
Maria Koetter	Lou Metro Gov	574-4148	Maria.Koetter@louisvilleky.gov



PPL companies

Energy Efficiency DSM Advisory Group Meeting – Sign in Sheet
Tuesday, October 29, 2013
Fairfield Inn & Suites
2:00p – 4:00p

Name	Organization	Phone	E-Mail
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Kevin Craft	LGE/KU	502-627-2397	kevin.craft@lge-ku.com
David Huff	LGE/KU	502-627-4662	david.huff@lge-ku.com
Kelly Couch	LGE/KU	502-627-2768	kelly.couch@lge-ku.com



Louisville Electric and Gas/ Kentucky Utility Company DSM Program Review

December 2013

Louisville Gas and Electric Company / Kentucky Utility Company
220 West Main Street
Louisville, KY 40202

The Cadmus Group, Inc.

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CADMUS

Principal Investigators:

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Cadmus: Energy Services Division



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Executive Summary

Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU), collectively referred to in this document as "the Company," hired Cadmus to review its 2012 – 2018 demand side management (DSM) program plan. This review was performed in conjunction with a study of energy-efficiency potential (the potential study) that has provided data to help guide recommendations for programs that will be filed in late 2013 or early 2014.

The review involved a detailed consideration of the Company's existing programs, a gap analysis to identify any potential new program measures and delivery options resulting from the potential study, secondary research on a range of programmatic topics, and development of recommendations for each program moving forward. Cadmus worked closely with staff at the Company to identify potential enhancements to existing programs, new programs or program components, and market conditions associated with programs nearing the end of their approved implementation cycle.

Task details included:

- Review of all DSM program planning, marketing, and process materials.
- In-depth discussions with individual program staff for each current DSM program.
- Discussions with Company staff regarding new program concepts.
- Comparison of individual DSM program features to industry best practices.
- Review of high level results of the potential study with regard to end-uses, customer sectors, and building types offering the largest portions of achievable potential.
- End-use and measure-level gap analysis comparing existing measures in the Company portfolio to the potential study results to identify gaps and to develop program-specific measure recommendations.
- Review of data gathered through surveys of residential and nonresidential customers.
- Secondary research and benchmarking of various metrics against appropriate peer utilities to better understand specific programmatic questions and to support recommendations.
- Report that summarizes the review and lists actions the Company will adopt in its new plan, associated with each program.

Overview of Portfolio

Energy efficiency continues to grow as a priority in energy resource planning across the country. In Kentucky, the Company has been working on energy efficiency since the mid-1990s, offering residential incentives, audits, and demand/response programs long before Governor Steven Beshear introduced Kentucky's 7-Point Strategy for Energy Independence in 2007. As state and federal policies evolve, the Company has prioritized energy efficiency by continuing to research and add new programs and enhance existing programs in order to keep up with changing customer needs and growing energy



demand. The Company continues to demonstrate its commitment to energy efficiency by offering best practice programs to its customers.

The Company offers a variety of residential and commercial programs that target customers and offers measures consistent with the findings in the Company's potential study. These programs are efficient and cost-effective, and they adhere to many industry standards for best practice. Many have been meeting saving goals in the last several years and contributing to the portfolio's overall success. The Company has been diligent in monitoring progress and making changes and enhancements to improve its programs particularly any that are struggling to meet the original program design goals.

The Company's current portfolio of nine residential programs, four commercial programs, and one program focused on energy education is structured well to capture available energy savings and demand reduction potential. These programs offer flexible options and a wide variety of prescriptive and custom efficiency measures, demand conservation, and technical support to the Company's residential and commercial customers.

Residential Sector

The Company's residential portfolio emphasizes single-family housing, which is discussed in the Summary of Findings section; it comprises the bulk of the residential sector efficiency potential but also includes program opportunities for multifamily and low-income segments. This portfolio offers residential energy audits with direct installation measures, appliance recycling, direct load control, and a comprehensive suite of prescriptive rebates, as well as programs targeting energy-efficient behavior. Currently the program offers incentives for heat pumps, central air conditioning, water heaters, insulation and appliances.

Commercial Sector

In the commercial sector, the Company offers both prescriptive and custom energy-efficiency opportunities, as well as technical support for facility audits and incentives for demand reductions. Currently the program offers incentives for cooling, lighting, exhaust ventilation, refrigeration, and motor and pumps.

Please see Table 1 for details on each program the Company currently offers, as well as new programs currently under consideration and each program's performance status for the next delivery period.

Table 1. Program Details

Program	Status	Eligibility	Performance	Action
Residential High Efficiency Lighting	Existing	All residential electric	Achieving goals	Allow to expire. Monitor LED market.
Energy-Savings New Homes	Existing	Single-family, multifamily; electric and/or gas customers	Achieving goals	Allow to expire. Keep training component under Customer Energy Education and Information Program.
HVAC Test and Tune-up	Existing	All residential and commercial electric	Not meeting participation expectations	Allow to expire.
Dealer Referral Network	Existing	N/A	N/A	Allow to expire. Continue contractor support through other programs.
Commercial Demand Conservation	Pilot/New	All commercial with load $\geq 200\text{kW}$	Met targets for pilot in 2012	Develop pilot into full program.
Home Energy Rebates	Existing	All residential	Exceeding goals	Continue program and increase budget.
Commercial Energy Analysis	Existing	All commercial; electric and/or gas customers	Not meeting conversion goals	Continue program with modifications. Offer commercial Energy Rebates as a component.
Commercial Energy Rebates	Existing	All commercial electric	Not meeting participation expectations	Continue program. Assess cost-effective measures with potential (prescriptive or custom track). Offer as component under Commercial Energy Analysis.
Commercial New Construction	Under consideration	Commercial, new buildings	N/A	Add as new component to Commercial Energy Analysis.
Customer Education and Public Information and Children's Energy Education Programs	Existing	Schools: Kindergarten – 8 th grade	N/A	Offer trade ally and training as a new component.
Home Energy Analysis	Existing	Existing residential electric	Exceeding audit goals, Not reaching conversion rate goals	Continue program; add new weatherization component.
Smart Energy Profile	Existing	All residential electric	Meeting demand goals, Not meeting energy savings goals	Monitor results through end of current program funding cycle.
Residential Demand Conservation	Existing	All residential electric	Achieving goals	Continue program.
Fridge and Freezer Recycling	Existing	All electric residential rates (Residential and small commercial)	On track to meet goals in 2013	Continue program.
WeCare	Existing	Standard LIHEAP (150% FPL)	Achieving goals	Continue program and begin to work with more community action groups (CAGs).



One of the Company's main goals for this review process was to identify ways to achieve energy savings and demand reductions by enhancing the programs that are currently offered and adding or removing programs in response to changing state and federal standards and evolving market conditions. The Energy Independence and Security Act of 2007 (EISA) lighting standards, changing standards for HVAC and water heating equipment, and the adoption of the 2009 International Energy Conservation Code (IECC 2009) by the state of Kentucky have contributed significantly to shaping these programs.

Organization of This Report

The remainder of this report consists of the following three sections.

1. **General Approach and Methodology** provides an overview of the research and analysis tasks Cadmus conducted to inform our recommendations.
2. **Summary of Findings** includes a high level discussion of Cadmus' general research findings at a portfolio level.
3. **Portfolio Programs** includes discussion of Cadmus' research activities and anticipated outcomes associated with each of the Company's existing programs as well as new programs that the Company will propose as part of the 2014 to 2018 program cycle.

The report also includes an appendix that describes the measure-level gap analysis tool and results for both residential and commercial programs.

General Approach and Methodology

Cadmus' assessment included reviews of the overall results of its potential study and results of surveys, a primary data collection effort that supported the potential study, as well as a more granular analysis of the gaps between measure- and sector-level potential and the Company's current programs. We also conducted a qualitative review of the Company's programs compared to industry-accepted best practices, with additional research and benchmarking to address specific researchable questions and to inform our recommendations.

Methodology for Measure Gap Analysis

Cadmus performed an end-use and measure-level gap analysis, in which we compared measures currently offered in the Company's residential and commercial energy-efficiency programs to the efficiency measures we assessed in our potential study. The purpose of the measure gap analysis was three-fold:

- Rank the 20-year technical and achievable potential of the measures analyzed in the potential study to determine which offer the best opportunities for program deployment.
- Identify cost-effective or nearly cost-effective measures.
- Compare cost-effective measures that offer good potential to those currently offered by the Company in order to identify any gaps.

To determine the potential energy and demand savings for currently offered measures, Cadmus first reviewed measure application forms and program histories provided by the Company. We next compiled a complete, definitive list of measure offerings by program for both the residential and commercial sectors and aligned these with measures from our potential study results.

It is important to note that aligning energy-efficiency program measures with those in a potential study is not an exact science. For example, a residential appliance rebate program may offer an incentive for ENERGY STAR® refrigerators. However, a potential study models energy savings on a much more granular level, typically involving multiple tiers of ENERGY STAR refrigerators. The potential study incorporated a broad range of measures that do not necessarily correspond with individual program measure offerings.

The analysis and results of the gap analysis are provided in spreadsheet format in Appendix A. For both the residential and commercial sectors, this spreadsheet contains the program name, group, incentive level, and name for each measure currently offered by the Company. Cadmus aligned this information with the corresponding measure name and the following measure details from the potential study:

- Technical and achievable energy savings
- Technical and achievable demand savings
- Technical and achievable energy savings potential rank

- Technical and achievable demand savings potential rank

Cadmus also included measures in the gap analysis that are not currently offered by the Company but that were shown to be cost-effective or nearly cost-effective¹ using the total resource cost (TRC) version of the benefit-cost ratio. For each of these additional measures, we weighted the benefit-cost ratios by savings values across the three housing segments for residential applications (single-family, multifamily, and manufactured homes) and across all 11 building types for commercial applications.

Where a measure was cost-effective in at least one market segment, Cadmus classified the measure as nearly cost-effective and included it in the gap analysis. For example, occupancy sensors for some commercial lighting applications are cost-effective in several building applications, such as large offices, but not in others, such as restaurants.

Cadmus ranked the 20-year technical and achievable potential for both energy (kWh) and demand (kW) savings as high, medium, or low, depending on their respective energy and demand savings relative to the total potential for all measures. The measure analysis spreadsheet also shows the savings and demand values we used to determine these rankings as well as the count of measures within each ranking.

Cadmus screened measures based on cost effectiveness and saving potential to identify measures that may warrant attention by the Company's programs. Because measures with very low incremental costs are not appropriate for downstream rebate mechanism, we used incremental cost as a secondary screen.² We considered those measures achieving a benefit-cost ratio of 1.0 or higher, ranked as having medium or higher achievable potential and incurring incremental costs of at least \$30 to be worthy of consideration by the Company.

In general, the measure-level gap analysis revealed that the Company's programs are geared toward ensuring the acquisition of cost-effective energy and demand savings; these programs offer measures that align well with the measures our potential study found to have the most energy-savings potential. The gap analysis also uncovered a few residential and several commercial measures offering cost-effective savings or demand potential but that the Company either currently does not offer or offers only through its custom incentives. A more detailed discussion of these measures is provided in the Summary of Findings section below.

¹ Because we assess cost-effectiveness at the level of "measure-category" which may include multiple discrete measures, some measures in a category may be cost-effective while others are not. In these cases, the measure category was deemed nearly cost-effective and included among those measures considered viable. During its planning process, the Company will analyze the cost-effectiveness of each measure under consideration for its energy-efficiency programs, using specific data relevant to its market and operational scenario.

² Due to program delivery and transaction costs associated with processing rebate applications and to the risk of incurring high levels of freeridership, measures with incremental costs lower than \$30 were deemed inappropriate for downstream rebates. Cadmus used secondary research on average measure costs (including labor) to estimate incremental costs.

Methodology for Best Practice Gap Analysis

As part of this review process, Cadmus evaluated best practices for each type of program the Company offers. We reviewed and selected appropriate best practice attributes specific to each program type and appropriate to the Company's portfolio and service territory. The best practices gap analysis examined the following five program functions:

- Program Management
- Measures and Incentives
- Marketing and Education
- Program Delivery and Implementation
- Tracking and Quality Control

To identify applicable best practice attributes for individual program categories, Cadmus conducted secondary research using a range of industry publications as well as our own database of resources collected from conducting many hundreds of efficiency program evaluations and program design projects. We consulted these specific resources for this task:

- National Energy Efficiency Best Practices Study. www.eebestpractices.com
- "Visible and Concrete Savings: Case Studies of Effective Behavioral Approaches to Improving Customer Energy Efficiency." Friedrich, Katherine, Jennifer Amann, Shruti Vaidyanathan, and R. Neal Elliot. October 2010. American Council for an Energy-Efficient Economy, Report Number E108. www.ACEEE.org
- "Energy Efficiency Program Best Practices." U.S. Environmental Protection Agency (EPA). http://www.epa.gov/cleanenergy/documents/suca/napee_chap6.pdf
- "States Stepping Forward: Best Practices for State Led Energy Efficiency Programs." Sciortino, Michael. September 2010. American Council for an Energy-Efficient Economy, Report Number E106. www.ACEEE.org
- "Saving Energy and Money: How to Start, Expand, or Refine Municipally Owned Utility Programs, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Service Areas in Texas." October 31, 2011. Report developed by Nexant and the Cadmus Group for the Texas State Energy Conservation Office.
- "Jump Starting Your EE Portfolio: Quick Start, Quick Return Energy Efficiency Programs." May 2009. Institute for Electric Efficiency White Paper.
- "Demand Response 2.0." Malme, Ross, Phil Davis, and Jessica Strömbäck. August 2010. Fortnightly's SPARK. http://c.ymcdn.com/sites/www.peaklma.org/resource/resmgr/docs/puf_dr_2.0_final.pdf

Under each program function, we compiled the most appropriate best- practice program attributes for the program being evaluated, based on our understanding of the Company's market conditions and program characteristics. We then compared each attribute to the practices the Company uses in its



current and continuing programs in order to identify areas where those programs already employ industry best practices as well as any areas that offer options for potential future growth. (We did not conduct this exercise for programs that are expected to expire in 2014. These programs are discussed in the next chapter.)

Overall, this review revealed that the Company offers well-designed, efficient programs, which already adhere to many industry standard practices and produce reliable energy savings and demand reductions. These findings are discussed in greater detail in the program-specific sections that follow.

It is important to note that this research was not intended to highlight program deficiencies. It would be unlikely that any utility efficiency program could incorporate every possible best practice strategy. Resource constraints and the realities of on-the-ground program implementation require that program managers establish priorities and select the program design and delivery strategies that best meet their overall objectives. Given that many of the Company's current programs are already considered successful and largely achieve their energy savings targets, this exercise is intended to provide options for consideration to improve program efficiency, support expansion, or capture higher energy savings as the Company's programs and market continue to evolve. Each best practice strategy should be considered within a programmatic context for its ability to cost-effectively contribute to program goals.

Benchmarking

To address several research questions and to provide context for our recommendations, Cadmus conducted benchmarking research. This research, in the form of a literature review, allowed us to compare performance and operational parameters such as participation rates, incentive levels, and participation requirements with comparable programs in other jurisdictions. We focused on these sources:

- Previous program evaluations conducted by leading evaluation firms, including Cadmus.
- Annual reports published by investor-owned utilities with similar programs.
- General program information published on the Internet.

As a general policy, Cadmus includes the utility and program name when using benchmark data that are publicly available. However, in some cases, we rely on data from our own internal benchmarking database, which has not been made public; in these instances, we typically refer to comparable utilities by a regional indicator but do not provide the utility or program names to protect our client's privacy.

Summary of Findings

Potential Study Findings

Cadmus conducted an independent study of the long-term technical, economic, and achievable potential for electric and natural gas efficiency in the Company's service territories from 2014 to 2033. The detailed results of this study are provided under a separate cover, in the report "Energy Efficiency Potential Study." This section provides a high level overview of the potential study's relevant findings and their consistency with and gaps compared to the Company's current and planned programmatic activities.

Technical and Economic Potential

Sectors and Segments

Cadmus' study found that the residential sector offers the largest portion (68%) of electric technical and economic potential. The commercial sector accounts for the remaining 32%. The residential sector also dominates natural gas potential with 68% and 73% of technical and economic potential compared with the commercial sector's 32% and 27%, respectively. In comparing the potentials study results to existing programs, we found that the Company's current planning efforts largely align with available potential in its territory. For example, with two-thirds of its potential in the residential sector, approximately two-thirds of the Company's portfolio of programs targets residential sector customers.

Within the residential sector, Cadmus looked at six specific segments (existing and new construction single-family, multifamily, and manufactured homes) and found that single-family housing dominates in the total residential economic savings potential (88% electric and 93% natural gas). Modest additional potential is available in the multifamily sector, with 7% electric and 7% natural gas economic savings potential, and in the manufactured homes segment, with 5% electric savings economic potential.³ Again, the Company's current residential portfolio is consistent with these potential findings. The bulk of the program offerings target single-family homes; while multifamily properties are eligible to participate, this sector is not an area of emphasis for the Company.

Within the commercial sector, Cadmus looked at 22 segments (11 building types within existing and new construction) and found that the large retail segment offers the greatest portion (25%) of economic electric potential, followed by large and small offices at 11% each and grocery at 10%. The health sector (19%) and large retail (17%) showed the largest natural gas potential. For both electric and natural gas, the miscellaneous segment showed very high potential (15% electric and 32% natural gas), but because this segment consists of a mix of building types that do not fit into any others, it is not useful for developing targeting strategies. While the Company's current commercial portfolio is offered to all commercial building types, it has had significant success targeting universities, with larger school districts and hospitals also beginning to gain traction. As discussed in the Program Portfolio section

³ Manufactured housing typically exhibits higher electric heating saturations than other home types, increasing its relative shares of electric potential and virtually eliminating natural gas potential.



below, the Company is interested in exploring additional commercial building sector targets. These study results reveal several good potential target sectors for capturing additional savings.

Measures and End Uses

Cadmus analysis of potential by measure type and comparison to the Company's existing programs also found few programmatic gaps. The Company's existing residential equipment program, Home Energy Rebates, and its income-qualified program, WeCare, include measures in the top five measure categories. The Home Energy Analysis program also includes direct installation measures that address water heat, the building shell, and lighting. Table 2 shows residential sector potential by measure category in order from the highest to the lowest share of economic potential, and the corresponding measures that are currently offered by applicable Company programs.

Table 2. Residential Sector Measures Offering Energy-Efficiency Potential

Measure Category	Measures Offered	Applicable Programs	Share of Economic Potential	
			Electric	Natural Gas
Heat Pump	Air source heat pump > SEER 14.5 Air source heat pump > SEER 14	Home Energy Rebates	26%	N/A
Heating	Heating system tune up; programmable thermostat, weatherization	WeCare	20%	87%
	Air sealing, duct sealing	Home Energy Analysis		
	Insulation measures	Home Energy Analysis (new component)		
Cooling	Split System AC > SEER 14.5 Single package AC > SEER 14	Home Energy Rebates	15%	N/A
	Air sealing, duct sealing	Home Energy Analysis		
	Insulation measures	Home Energy Analysis (new component)		
	AC tune up and replacement; programmable thermostat, weatherization	WeCare		
Water heat	ENERGY STAR Heat pump water heater	Home Energy Rebates	13%	13%
	Faucet aerator, low flow showerhead	Home Energy Analysis		
	Water heater insulation, low flow showerhead, faucet aerator	WeCare		
Appliances	ENERGY STAR clothes washer, dishwasher, Freezer, refrigerator	Home Energy Rebates	12%	N/A
	ENERGY STAR refrigerator	WeCare		
	Refrigerator, freezer recycling	Fridge and Freezer Recycling		

Measure Category	Measures Offered	Applicable Programs	Share of Economic Potential	
			Electric	Natural Gas
Ventilation and Circulation	N/A	N/A	6%	N/A
Lighting	CFL Bulb (direct install)	Home Energy Analysis	4%	N/A
	CFL Bulb (direct install)	WeCare		
Plug Load	Smart strip (direct install)	Home Energy Analysis	4%	N/A

Cadmus' potential study found few additional residential measures offering all three key criteria: (1) cost-effectiveness, (2) medium or higher achievable savings potential and (3) sufficient incremental costs to accommodate an incentive program. Table 3 summarizes additional residential measures identified.

Table 3. Cost-Effective Residential Measures with Achievable Potential

Measure	Incremental Measure Cost	Achievable Potential		Benefit-Cost Ratio
		Energy Saving	Demand Reduction	
Quality Installation – Central Air Conditioners	\$413	High	High	1.06
Quality Installation – Heat Pump	\$263	Med	Med	2.54
Electronically Commutated Motors	\$120	Med	Low	1.07
Exterior Door - Above Code (R-10)	\$194	Med	Med	0.99

It is difficult to compare estimates of technical electric potential across jurisdictions. This is because the potential depends on the unique characteristics of local markets based on critical variables such as fuel and equipment saturations, climate, and historical levels of energy-efficiency programmatic activities. Notwithstanding, when Cadmus compared its estimate of technical electric potential to the Company's sales forecast for the final year of the analysis, we found the Company's results were largely comparable with the results of other electric-efficiency potential studies in other jurisdictions. For example, a review of 90 electric-efficiency potential studies completed from 2001 to 2010 showed the electric technical potential averaging at about 24% of retail sales for all sectors (within a range of about 13% to 45%).⁴ Cadmus' study estimates the Company has a technical potential of 22%, which is well within the range of the studies conducted in other jurisdictions.

In the commercial sector, Cadmus' analysis of potential by measure type found the largest portion of economic electric savings potential derives from cooling measures (29%), followed by lighting (24%). The

⁴ Haeri, Hossein. "Frontiers of Efficiency." Public Utilities Fortnightly: pp. 39-44. April 2011.



largest portion of natural gas economic potential in the commercial sector comes from furnaces (60%) followed by water heating (20%). The Company's Commercial Energy Analysis program offers both prescriptive rebates and custom incentives that cover all of the top five measure categories we identified, including all measures with greater than a 9% share of economic electric potential. Table 4 shows the potential for the commercial sector measure categories in order from highest to lowest with corresponding measures the Company currently offers through its Commercial Energy Analysis program, either through a prescriptive or custom incentive.

Table 4. Commercial Measures Offering Energy-Efficiency Potential

Measure Category	Measures Offered	Applicable Programs	Share of Economic Potential	
			Electric	Natural Gas
Cooling	AC units	Prescriptive	29%	N/A
	Insulation, HVAC occupancy sensors	Custom		
Lighting	Lighting and fixtures	Prescriptive	24%	N/A
	Induction lighting	Custom		
Ventilation and Circulation	Motors and pumps, variable frequency drives	Prescriptive	15%	N/A
	Exhaust ventilation, ERV/HRV	Custom		
Refrigeration	Refrigeration	Prescriptive	9%	N/A
Plug Load	Compressed air, capacitor banks	Custom	9%	N/A
Heat Pump	N/A	N/A	8%	N/A
Pool Pump	N/A	N/A	3%	N/A
Water Heat	N/A	N/A	2%	20%
Appliances	N/A	N/A	1%	2%
Furnace (natural gas)	N/A	N/A	1%	60%
Boiler (natural gas)	N/A	N/A		10%
Servers	N/A	N/A	1%	N/A
Pool Heat	N/A	N/A	N/A	7%

When Cadmus applied an economic screen to each measure category to estimate cost-effectiveness, we found a few additional measures that passed the modified TRC/benefit-cost ratio, offer potential, and have incremental costs higher than \$30, but are not currently offered through the Company's existing commercial program (see Table 5).

Table 5. Cost-Effective Commercial Measures with Achievable Potential

Measure Currently Offered	Achievable Potential		Benefit-Cost Ratio
	Energy Savings	Demand Reductions	
Direct Digital Control System-Installation	High	High	2.61
Network PC Power Management	High	Med	1.98
Windows - High-efficiency	Med	Med	141.91*
Hotel Key Card Room Energy Control System	Med	Med	2.59
Cool Roofs	Med	Med	1.50
Occupancy Sensor Control	High	Med	0.90
*The high Benefit-cost ratios result from the full energy savings from moving from an average existing window to an above code window (U-0.32) but only include the incremental cost between the above code window and the baseline code window (U-0.40).			

While some of these measures may be appropriate for the Company's consideration for new commercial prescriptive or custom incentives, others, such as hotel key card control systems, are likely to have limited application in the Company's territory. Thus, the Company must consider the likely costs and benefits of each measure in the context of its market and operational environment to make informed decisions about the measures' potential impacts to the entire portfolio.

Achievable Potential

As part of the potential study, Cadmus conducted phone surveys with 412 residential customers and 196 commercial customers to gather information on their awareness, perceptions, actions related to energy-efficiency in general and the Company's energy-efficiency programs in particular, and to assess factors affecting program participation.

To assess achievable potential, Cadmus used the results of this survey to further determine the fraction of residential customers who would likely adopt energy-efficiency measures under low, medium, and high incentive scenarios. The low scenario corresponds to no utility incentive, medium assumes an incentive covering 50% of the measure incremental cost, and the high scenario assumes an incentive covering 75% of the measure's incremental cost.

It is important to note that the surveys questions were not limited to cost-effective measures, so application of these results to economic potential may overstate the amount of achievable potential at any incentive level. As discussed earlier, the Company's relatively low avoided costs had a significant effect on measure-level cost-effectiveness results and the quantity of available economic potential. Thus, these results are intended only to provide general insights into customer behavior, which can inform program design and implementation strategies.

Figure 1 shows residential customers' willingness to adopt efficient measures under different incentive scenarios.



Figure 1. Residential Willingness-To-Adopt by Measure Type

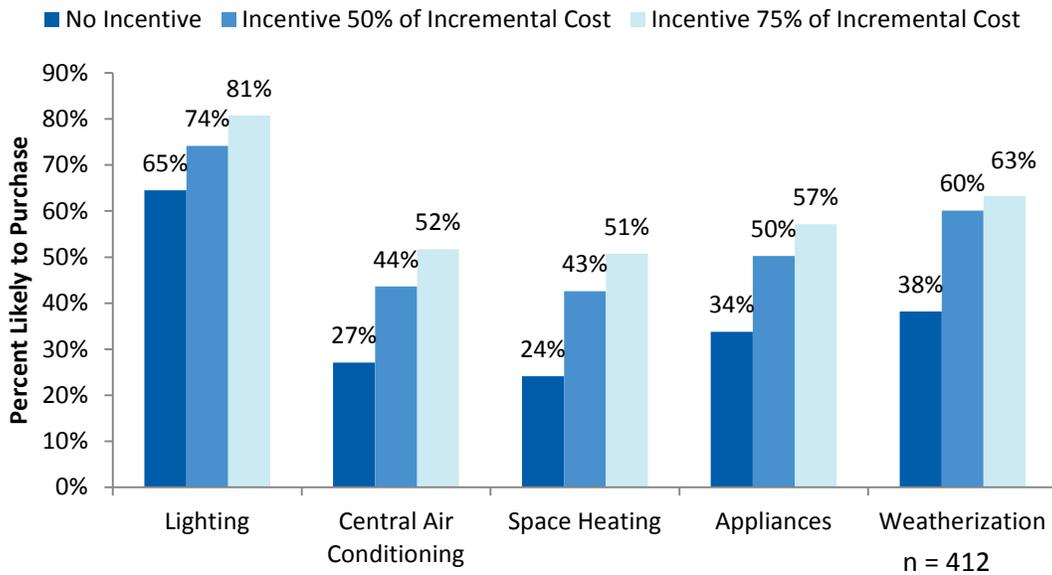
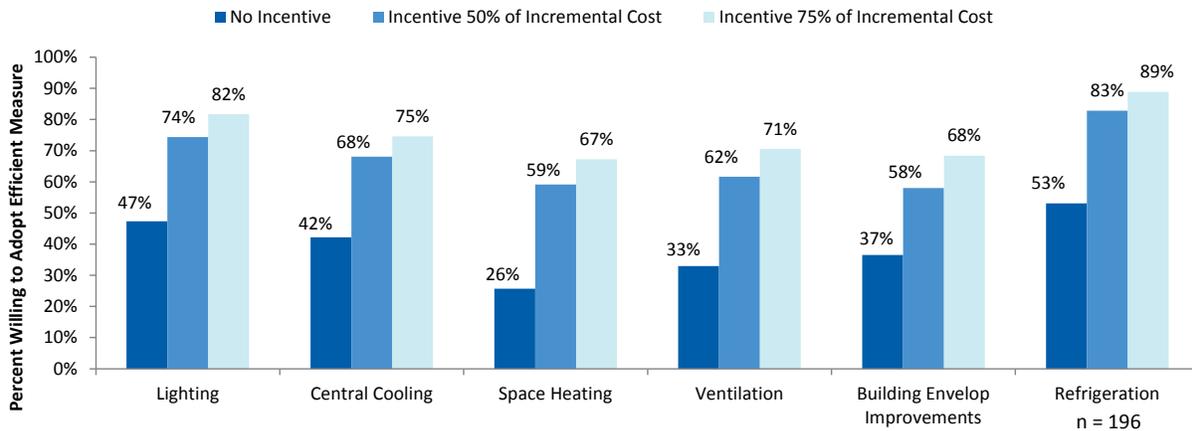


Figure 2 shows commercial customers’ willingness to adopt efficient measures under different incentive scenarios.

Figure 2. Commercial Willingness-To-Adopt by Measure Type



In general, these findings are similar for both the residential and commercial customers. In most cases, customers indicated lower tolerance for adopting most measures under a low/no incentive scenario. Lighting is one exception, where there is a greater (particularly in the residential sector) willingness to adopt high-efficiency measures without any incentives, which suggests that to some degree the market for high-efficiency lighting is transforming and utility intervention may no longer be needed to drive lighting efficiency, again, particularly in the residential sector. This finding supports the Company’s intention to discontinue its efficient residential lighting program.

For the other end uses, customers' willingness to adopt under a no-incentive scenario was relatively low. In each end use category, willingness to invest increased by significant margins from a no incentive to a 50% incentive scenario.

Meanwhile, there continues to be significant economic barriers to customer adoption of more costly measures. An incentive level set at approximately 50% of the incremental cost may be the "sweet spot" for encouraging customers to invest in energy-efficient building upgrades. This appears to be particularly true for residential heating, cooling, and appliance measures and for commercial cooling, ventilation, and refrigeration, which were also shown to have good economic potential in the Company's territory.

Additional Survey Findings

The results of these surveys can help inform certain characteristics of the Company's programs and implementation strategies, particularly with respect to marketing and outreach and measures and incentive levels. Several key findings are described below.

Residential Findings

Residential survey respondents indicated that the cost of energy was a primary concern and that reducing energy costs was a primary motivator for conserving energy, adopting energy-efficient behaviors, and participating in energy-efficiency programs. Among respondents who had participated in an energy-efficiency program, 57% said bill savings was the reason they participated. However, when asked about reasons for not participating, only 14% noted a financial barrier, while 33% said a lack of information, 25% said inconvenience, and 20% said their home was already efficient.

These findings suggest the need for both increased awareness education to help residential customers understand the benefits of and ways to approach making efficiency upgrades in their homes. While the Company's marketing strategy includes a focus on cost-savings benefits, these findings indicate further exploration of other outreach options to increase customer awareness may be in the Company's interest. Furthermore, the majority (58%) of residential customers indicated that bill inserts was the most effective way to reach them with energy-efficiency program information; another 29% said mass media (radio, TV, etc.) was the best way to be informed.

Commercial Findings

Commercial customers are primarily concerned with costs. Survey respondents indicated their first considerations when investing in energy efficiency are cost of equipment and return on investment. Eighty-nine percent of respondents indicated that their primary motivator was saving money when investing in energy-efficiency upgrades and 30% said saving energy. Additionally, survey respondents indicated that cost was a primary barrier to investing in energy-efficiency upgrades. When asked the reasons for not investing in energy-efficiency upgrades, 61% said they could not afford the measure or it was too expensive.



A majority of survey respondents indicated the most effective way to inform them about the Company's energy-efficiency programs was through utility bill inserts. In total, these survey findings suggest several potential marketing and implementation tactics:

- Messaging that emphasizes the financial benefits of energy efficiency and potential return on investment, particularly for refrigeration and motors/pumps.
- Setting incentive levels to cover approximately 50% of the incremental costs of eligible efficiency measures, when possible.
- Use of bill inserts as a primary marketing channel.

The Company's residential prescriptive rebate program is achieving its goals and its commercial program has experienced increasing participation rates and is expected to meet its target this year. Thus, while these survey findings provide useful insights, it is important to note that, in making future program design and implementation decisions, the Company needs to balance its program performance expectations with practical considerations around program marketing and delivery costs and market constraints.

Program Portfolio

This section provides a review of the Company's current, expiring, and new programs including Cadmus' analysis findings and actions the Company will propose for the 2015-2018 program cycle.

Residential High-Efficiency Lighting

Program Description

The Company has offered its High Efficiency Lighting program since 2008. The program provides CFL bulbs to customers through a direct mail mechanism. Although originally launched as a coupon-driven program with a direct ship element, participation in the program remained low until the Company eliminated the coupon component in 2010.

Between one and three times per year, the Company has sponsored a bulb campaign. Customers opt in to the program by returning a postcard received in the mail. They are then mailed a package containing two to four CFL bulbs during each campaign.

Using a direct mail only approach, the High Efficiency Lighting program has been successful, exceeding its targets each year. Despite this success, however, new regulatory standards established by EISA will change the effective baseline from which savings are measured. The effect of this baseline change will reduce available lighting program savings by approximately 30% and affect the program's overall cost-effectiveness. The program is designated to expire at the end of 2014.

Research Results

Cadmus' assessment of potential included a review of standard CFLs. Although CFLs are likely to remain a viable measure in the near term, they offer zero economic or technical potential over the assessment's 20-year horizon; subsequently, CFLs will no longer be cost-effective. Furthermore, Cadmus' surveys indicated a high percentage (65%) of residential customers would purchase high-efficiency lighting measures regardless of the availability of incentives, indicating some level of market transformation around high efficiency lighting is taking place in the Company's territory. In preparation for these market changes, and in an effort to appropriately allocate its resource priorities, the Company has proposed to allow its High Efficiency Lighting program to expire in 2014.

Although there remains significant cost-effective potential for specialty CFLs, which are not affected by EISA, the Company's direct mail program delivery mechanism does not lend itself to specialty bulbs. Both the variety of bulb types and their variable market demand make direct shipments of a single type of specialty bulb impractical and potentially counter-productive for the Company's overall goals. In other words, when customers who have opted in to the program automatically receive a box of specialty bulbs for which they have no use, the program delivers no savings at a potentially significant economic and resource cost.



Many utilities across the country have already begun to plan for a post-EISA environment. Some jurisdictions are struggling not only with an increasing baseline but also very low net-to-gross (NTG) ratios as market penetration increases and signs of a transformed market become apparent. Most assume the next generation of lighting efficiency programs will focus heavily on light emitting diode (LED) bulbs. However, although LEDs offer numerous benefits over standard CFL bulbs, such as better lighting quality, a larger range of applications such as dimmable and three-way, and a longer useful life, the persistent high cost of LED technology remains a significant barrier to both market adoption and cost-effectiveness. However, as the cost of LEDs comes down, adoption of LED technologies is expected to significantly increase.

While the majority of utilities will continue to offer CFLs in the interim, most are attributing this effort to declining savings and are therefore devoting fewer resources over the next few years; many are discontinuing CFL promotions after 2015-2016. Many utilities have begun to offer LEDs in limited quantities or on a pilot basis or are planning to incorporate LEDs into their portfolios gradually over the next few years as CFLs begin to phase out.

Table 6 presents several examples of utility program expectations for CFLs over the next few years.

Table 6. Benchmarking Utility Plans for CFL Programs

Utility/Program Administrator	Standard CFL Program Status
Nevada Power	Suspended entire CFL program due to low NTG ratio.
PPL Electric Utilities in Pennsylvania	Promoting CFLs through 2016 with increasing emphasis on diverse lighting measures.
Maryland Utilities	Promoting CFLs through 2015.
Duke Progress Energy	Promoting CFLs through 2015.
Dayton Power & Light	Promoting CFLs through 2016, not yet promoting LEDs.
Massachusetts and Rhode Island Utilities	Promoting CFLs but reducing emphasis, while escalating support for LEDs over the next three years.
Efficiency Maine	Next three-year plan includes both standard and specialty CFLs and LEDs.
Interstate Power & Light in Iowa	2014-2018 plan anticipates 75% CFLs and 25% LEDs, with CFLs declining and LED increasing gradually.
Salt River Project	Continuing to promote standard CFLs, not yet promoting LEDs.

LED costs have come down rapidly over the past few years. One product released recently sells for under \$10; however, even at this price LEDs were not found to be cost-effective in the Company's potential study. As LED technology and lighting markets mature over the next few years, Cadmus anticipates energy-efficiency programs will change rapidly to capture the new savings stream available through LEDs.

Conclusions

Although the High Efficiency Lighting program has been successful over the last several years, exceeding targets and producing substantial savings for the Company's portfolio, the available cost-effective savings potential does not justify continuing the program as it is currently designed. Additionally, as discussed previously, Cadmus' potential study found that a majority of customers would be willing to invest in energy-efficient lighting without a utility incentive, indicating some level of market transformation is already taking place in the Company's territory.

The program's anticipated 2014 retirement is appropriate given the changing baseline for CFLs and the current market uncertainty around LED technology costs and cost-effectiveness, as well as increasing market adoption for energy-efficient lighting. However, Cadmus anticipates lighting will continue to play an important role in utility energy-efficiency portfolios. Maintaining flexibility with regard to new technologies and potentially new delivery strategies in the Company's portfolio will be key going forward.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the High Efficiency Lighting program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Allow the High Efficiency Lighting program to expire in 2014 as planned.
- Continue to monitor LED costs, market activity, and cost-effectiveness for future energy savings potential.

Energy-Savings New Homes Program

Program Description

The Energy Savings New Homes program, launched in 2008, was designed to transform the market by offering incentives to builders and Home Energy Rating System (HERS) raters for building new single- and multifamily homes that exceed the current energy code. Builders work with certified HERS raters to identify and specify design strategies and energy-efficiency measures that meet the eligibility criteria to qualify for the program. The Company offers a required program training as well as ENERGY STAR technical training a minimum of once per year based on market needs.

The program has two tracks, ENERGY STAR New Homes and Energy Smart New Homes.

- ENERGY STAR New Homes requires participating builders to meet the requirements of the national ENERGY STAR model and offers \$1,200 for full compliance.
- The Energy Smart New Homes track is based on achieving a HERS score that exceeds code. It offers several incentive tiers based on the building type and HERS score. The minimum eligible HERS score to receive incentives is 85.



The program has been successful every year, winning awards such as the ENERGY STAR Partner of the Year Award in 2011 and 2012, the 2010 RESNET Infrastructure Development award, and the ENERGY STAR Partner of the Year Award for Sustained Excellence in 2013, and has had a significant impact on the quality of new homes being built in the Company's territory since its inception. The partnerships between raters and builders drive the program's success; the program has grown to include more than 300 builders who have taken the training, of which 80 to 100 are active each year, and approximately 24 to 28 HERS raters.

Despite the program's success, however, two factors are impacting its long-term viability. Since the release of ENERGY STAR New Homes version 3.0, most of the builders and raters in the program have been participating in the performance-based track, Energy Smart New Homes. Builders in the Company's territory, along with those in many other areas around the country, find the new version of ENERGY STAR New Homes complicated and expensive.

Additionally, Kentucky adopted IECC 2009 in 2013. This new standard changes the effective baseline from which savings are measured, thereby reducing available program savings and overall cost-effectiveness. The Energy Savings New Homes program is designated to expire at the end of 2014.

Research Results

Cadmus conducted additional research to address specific questions dictated by the Company staff. The research question is listed below with a summary of our findings.

1. Can the program be cost-effective under IECC 2009 standards?

Cadmus reviewed several new homes programs in similar regulatory environments to help understand the likelihood of maintaining cost-effectiveness in the Company territory. Studies of similar programs revealed that most utilities have difficulty meeting cost-effectiveness standards under the Total Resource Cost (TRC) test in an IECC 2009 environment.

Table 7 shows cost-effectiveness test results for three utilities with climate conditions similar the Company's territory.

Table 7. Cost-Effectiveness Results for Residential New Homes Programs under IECC 2009

	Benefit to Cost Ratio
Utility 1 (Midwest)	0.67
Utility 2 (Midwest)	0.67
Utility 3 (South)	0.21

The IECC 2009 standards reduce the achievable savings in several areas, most noticeably for envelope measures such as insulation. Additionally, the declining cost of natural gas over the past

several years has further reduced the cost-effectiveness of envelope measures in new construction programs.

The baseline change resulting from the 2009 IECC affects both the ENERGY STAR New Homes and the Energy Smart New Homes program tracks. Although an ENERGY STAR home is largely a custom approach, whereby builders can employ a variety of different design strategies and energy-efficiency measures, in most cases the cost of meeting the standard under ENERGY STAR version 3.0 is a barrier to builders and to achieving cost-effectiveness.

Furthermore, the minimum HERS score required to meet program eligibility under the Energy Smart track is 85, which is roughly equivalent to a HERS score for a house built to meet the IECC 2009 standards. Not only does this severely limit program benefits, it likely engenders high program freeridership for the lowest tier.

Conclusions

Since 2008, the Energy Savings New Homes program has been steadily increasing the energy efficiency of new homes built in the Company's territory by encouraging builders and HERS raters to work together to build higher efficiency homes. The success of this program is apparent in the increase in the number of energy-efficient new homes on the market and by the number of trade allies now participating—over 300 builders and approximately 24 to 28 HERS raters. The program has been cost-effective and successful every year, winning awards annually, such as ENERGY STAR Partner. One of the keys to this success has been the program's strong training component, which has contributed to market transformation in the residential new construction industry in the Company's territory.

However, with the adoption of IECC 2009 in Kentucky, the long-term viability of the program is in jeopardy. Utilities around the country have begun to reassess and either redesign or discontinue their residential new construction programs due to failing cost-effectiveness. Allowing the Company's Energy Savings New Homes program to expire in 2014 as planned, while retaining the program's training and an active trade ally network—will allow the Company to continue to support the nascent high-performance homes market while avoiding the costs and risks associated with low program cost-effectiveness.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Energy Savings New Homes program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Allow the Energy Savings New Homes program to expire in 2014 as planned.
- Shift the Energy Savings New Home program's trade ally training component to the Customer Education and Public Information program and focus in the near term on educating builders about the IECC 2009 and newer standards and energy-efficient new construction practices in order to continue to support high-performance residential construction.

- Continue to support the program's success in building an active and engaged trade ally network of contractors and HERS raters.

Residential and Commercial HVAC Test and Tune-up

Program Description

The Residential and Commercial HVAC Test and Tune-up program offers a subsidized central air conditioner (CAC) or heat pump diagnostic test and tune-up to Company customers who work with a qualified contractor. When the program was launched in 2009, it required a contractor and service provider to make two visits to a home or business, one for the diagnostic test (contractor) and another to perform the tune-up (service provider). The program model was updated in 2011 to require just one contractor visit, during which both the diagnostic test and the tune-up could be performed.

The diagnostic test costs residential customers \$35 and commercial customers \$50. The tune-up, consisting of coil cleaning and refrigerant adjustment, costs \$50 for residential customers and \$100 for commercial customers. The remaining cost for the service is subsidized through the Company program incentives. There is no upfront cost to the customer; both the test and the tune-up are paid through the customer's utility bill.

Nine qualified contractors work with the Company's implementer to conduct tune-ups. The implementer performs quality assurance/quality control (QA/QC) site visit inspections on a random sample of contractor jobs, a minimum of once per month per contractor.

According to the Company staff, the HVAC Test and Tune-Up program has had lower customer and contractor engagement than anticipated, which has negatively impacted its cost-effectiveness. The program has undergone several design changes over the last several years, which have produced incremental improvements but failed to achieve participation goals. The program is designated to expire at the end of 2014.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. Each research question is listed here with a summary of our findings.

1. Are there ways to improve the program's cost-effectiveness?

Cadmus conducted a benchmarking study of similar programs to compare implementation, incentives, and program structures commonly found in other HVAC test and tune-up programs. We also consulted an experienced HVAC program evaluation expert to identify implementation best practices for this type of program. Table 8 presents the results of this study.

Table 8. HVAC Test and Tune-up Benchmarking Comparison

Benchmarking Component	Ameren Missouri Check-Me Plus		DP&L's Certified HVAC Tune-Up™ Program		Potomac Edison (FirstEnergy) Maryland Residential HVAC Program		Pennsylvania Power and Light HVAC Tune-Up Program
Standalone program? (Y/N)	Yes		Yes		No		Yes
Third-party implementer	Proctor Engineering Group (PEG)		CSG		Honeywell		Third party
Incentive Amount	Diagnostic test on existing AC or heat pump	\$35 (contractor)	Tune-up of AC or heat pump	\$30 each for units 51 through 100; \$50 each for units 101 through 120; \$70 each for units 121 through 140;	\$30 each for units 51 through 100; \$50 each for units 101 through 120; \$70 each for units 121 through 140;	\$100 (customer)	\$30 each for units 51 through 100; \$50 each for units 101 through 120; \$70 each for units 121 through 140
	Refrigerant charge repair	\$55 (customer)	Diagnostic test and tune-up	\$40-\$110 (contractor)	Tune-up with ECM furnace fan replacement	\$140 (customer)	
	Indoor Coil Cleaning	\$40 (customer)					
	Outdoor Coil Cleaning	\$25 (customer)					
	Heat pump strip heat lock out (install)	\$75 (customer)					
	Heat pump strip heat lock out (reset)	\$25 (customer)					
	Concept 3™ indoor blower motor retrofit	\$200 (customer)					
Who gets incentive?	Contractor and customer		Contractor and customer		Customer		Contractor



Benchmarking Component	Ameren Missouri Check-Me Plus	DP&L's Certified HVAC Tune-Up™ Program	Potomac Edison (FirstEnergy) Maryland Residential HVAC Program	Pennsylvania Power and Light HVAC Tune-Up Program
What does visit consist of?	<ol style="list-style-type: none"> 1. Diagnostic test on AC or heat pump. 2. Diagnostic test data called in; reviewed by PEG. 3. Approval given for recharging the cooling refrigerant, airflow adjustments (non-duct), and cleaning coils and filter. 	<p>25-point certified tune-up process using the latest in digital equipment and software. (Test-in, test-out). Residential CAC units or air-source heat pumps. Units must pass test-ins and test-outs to qualify for incentive.</p>	<p>Maintenance tune-ups on a checklist Thermostat checked Air filter inspection Condensate drain inspected Evaporator coil and fan inspected Refrigerant lines inspected Condenser coil and fan motor inspected Proper refrigerant charge level checked</p>	<p>Contractors use Service Assistant to diagnose the HVAC system</p>
Is there contractor training? (Y/N)	Yes	Yes	Yes	Yes
Cost-effectiveness TRC	N/A	0.1	N/A	0.71
Citation	The Cadmus Group, Inc. 2012. <i>CheckMe! Plus Program Evaluation: Year 2.</i>	<ol style="list-style-type: none"> 1. The Cadmus Group, Inc. 2012. DP&L 2011 Portfolio Evaluation, Measurement, and Verification Report. 2. http://www.dpandl.com/save-money/residential/heating-cooling-tune-ups-for-your-home/ 3. http://www.businesswire.com/news/home/20100408005994/en/DPL-Teams-Local-Contractors-Residential-Customers-Reduce 	<ol style="list-style-type: none"> 1. Navigant Consulting, The Cadmus Group, Opinion Dynamics Corporation. 2012. "Chapter 6: Residential Heating, Ventilation and Air Conditioning Program (HVAC)." Empower Maryland: 2011 DRAFT Report. 2. http://energysavemd-home.com/hvac/ 3. http://energysavemd-home.com/uploads/misc/FEPE_HVACTrifold_final_LR.pdf 4. http://energysavemd-home.com/assets/pdf/fe_md_pe_hvac_participating_contractor_agreement.pdf, 5. http://energysavemd-home.com/uploads/rebates/FEPE_HVACTuneUp_R3_final_LR.pdf 	The Cadmus Group Inc. 2011. PY2 Final Annual Report to the Pennsylvania Public Utility Commission.

Cadmus found few viable options for increasing the HVAC Test and Tune-Up program's measure offerings. The program already offers the two most cost-effective measures as part of the tune-up: coil cleaning and refrigerant charge. A few utility programs offer indoor coil cleaning, which provides some additional savings but is time-consuming and requires contractors to dismantle the system. As discussed in question 3 below, HVAC tune-up programs need an engaged contractor base but the burdensome requirements may affect contractors' willingness to participate, thereby offsetting any savings gains from the new measure. Replacing the air filter is a low cost, simple option, but the savings are minimal.

Because the savings are slightly higher for heat pumps than for central air conditioners, increasing the number of heat pump tune-ups conducted by the program could increase program savings and improve cost-effectiveness results. Conducting targeted marketing to heat pump customers may encourage more participation; however, given that the Company's heat pump saturation is below 30%, this approach is likely to make only a moderate impact on the program's overall cost-effectiveness and savings.

HVAC tune-up programs frequently suffer from high costs and lower than anticipated savings. Without conducting a more detailed analysis of program costs and benefits (which was not included in the scope of our research), we were not able to determine specific factors that may be contributing to the programs' cost-effectiveness results. Company staff noted that HVAC Test and Tune-Up has had lower participation than anticipated from both customers and contractors, which likely impacts the program's overall cost-effectiveness.

2. Should the utility consider rolling this program into another program, such as the Home Rebate program to save on cost? If so, what rebate levels would be appropriate?

Cadmus found examples of HVAC tune-up programs in other jurisdictions both as stand-alone programs and as components of larger programs. Both models have worked successfully; however, HVAC tune-ups require several program-specific delivery and administrative tasks that are consistent regardless of where a program is housed within a portfolio.

Cadmus found that typical customer rebate levels for tune-up programs integrated with residential rebate programs ranged from \$75 to \$125, with a small additional incentive often going to contractors. On a per-tune-up basis, the Company's subsidy approach covers up to \$250 of the tune-up cost; thus, changing the rebate structure to match the high end of the typical range for residential rebates (\$125) would cut the Company's program incentive budget in half. Depending on the number of tune-ups performed per year, this change could save a significant amount and may reduce some administrative costs. However, Company staff noted that contractors active in its territory have frequently adjusted their own tune up service costs in order to undercut the Company's cost structure, essentially creating a competitive environment with non-participating HVAC contractors. As a result, the Company already struggles to retain market share, and because



shifting to a lower rebate level would place a greater portion of the payment responsibility on the customer, it could further reduce program participation and, thus, savings.

The majority of program implementation and delivery costs would not be affected by shifting HVAC tune-ups to the Home Energy Rebates program. The primary functions of an HVAC tune-up would not change and the program would continue to incur the majority of implementation costs, such as contractor management, verification and quality control, training, marketing, incentive processing, tracking, and evaluation.

3. Are there ways the utility can engage customers or boost participation?

Successful HVAC tune-up programs rely on two factors to drive participation. First, a combination of contractor engagement and customer-focused marketing is needed to create a push-pull effect. Because the profit margins on HVAC system tune-ups are low, especially compared to new system installation, contractors have little motivation to promote this type of program. However, since customers often look to contractors as a reliable source of information on their HVAC systems, keeping contractors engaged is critical for program success. The program also needs to market directly to customers whose awareness of the need for HVAC system maintenance is typically low.

Second, the program must fairly compensate contractors for the level of effort required to deliver tune-ups. Contractors will be more likely to promote the program if its design is straightforward and supported by program training and technical support, coupled with incentives large enough to justify contractors' time and effort. Additionally, HVAC contractors work is largely seasonal; because they must focus on emergency equipment replacements during winter and summer, their window of opportunity for tune-ups is limited to spring and fall.

Thus, in both program design and marketing strategies, successful program implementation calls for a balance between contractor needs and customer focus. The Company achieves this balance by subsidizing the cost of the service to customers (the customers' portion is included on their utility bill) and paying the subsidy directly to contractors. The program allows the customer to obtain the service with no upfront cost, which is a selling point for contractors, and contractors bear no payment risk because they are reimbursed quickly by the utility.

Because the Company engages with a small number of approved program contractors, marketing largely focuses on customers and includes Internet and direct mail outreach. The Company's program is also relatively simple for contractors to deliver. The program provides training to contractors to ensure they understand the rules but requires no special certifications. The program requirements regarding diagnostic testing and tune-up are not onerous and should not represent a barrier for contractors. And, because contractors dictate the fees they charge for the service, which in turn are paid directly by the Company, they are compensated for their work.

Cadmus did identify two potential participation barriers for this program. First, the Company works with only nine contractors to deliver services for this program. Staff at the utilities indicated that they had experienced some difficulty managing participation with delivery capacity.

Second, only customers who have never participated before are eligible for the program incentive. Most of the other programs Cadmus reviewed allow customers to receive a tune-up every three to five years. Allowing repeat participation could increase participation marginally.

Conclusions

The HVAC Test and Tune-up program already includes the most cost-effective elements used by peer programs, including a diagnostic test, coil cleaning, and refrigerant charge. The program also incorporates the critical elements inherent in successful programs: a straightforward design, customer marketing, and generous incentives that create value for both customers and contractors.

Although the Company has continued to make improvements that have made the program more successful, it is still not meeting goals. The Company's program incentives are considerably higher than those offered by similar utility programs. If the Company switched to a rebate incentive mechanism and rolled HVAC tune-ups into its Home Energy Rebates program, the reduction of cost might be enough to marginally improve its cost-effectiveness; however, lower incentives can have the effect of reducing participation and, in turn, savings. Alternatively, steps to increase participation, such as increasing the number of participating contractors and/or conducting a more aggressive customer marketing campaign, could also improve cost-effectiveness; however, the overall impact is likely to be negligible.

It is not uncommon for HVAC test and tune-up programs to be marginally cost-effective at best. These programs often suffer from high delivery and administrative costs, coupled with contractor constraints and a low awareness among customers, all of which can result in lower than expected cost-effectiveness. Given these challenges, the program's anticipated 2014 retirement is appropriate at this time.

Outcomes

In light of the potential study findings and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the HVAC Test and Tune-up program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Allow the HVAC Test and Tune-up program to expire in 2014 as planned.
- Continue to monitor market activity and program cost-effectiveness for future energy savings potential.



Dealer Referral Network

Program Description

The Company has supported trade allies in its territory in a number of ways; one of these is through the Dealer Referral Network program. This program provides information to trade allies about the Company's equipment-based and behavior programs.

The Company also maintains a web-based list of service providers, from which customers can select contractors who are qualified to install program equipment or improvements. The online searchable database allows customers to choose a service provider based on their location.

It also offers contractor selection guidelines from the Better Business Bureau[®], such as:

- Get at least three to four quotes from service providers.
- Obtain a written contract that includes the specified price, work to be done, and the completion date.

The Company does not claim savings from the referral network, which functions as more of a customer service than a traditional energy-efficiency program. The program is designated to expire at the end of 2014.

Research Results

Cadmus conducted additional research to address specific questions dictated by the Company staff. The research question is listed below with a summary of our findings.

1. The Company plans to discontinue this program, unless there is a reason to keep or modify it.

While most utilities across the country offer some form of dealer or trade ally support function, they approach these functions in different ways. Some include the network as a program in their portfolio, albeit one that does not produce energy savings, while others include trade ally support functions as components of education and marketing.

By providing information to help contractors stay abreast of program activities and changes, the Company's Dealer Network provides an important and necessary service to its program contractors. However, the Company also provides similar trade ally support through individual program activities, which creates some redundancy.

Offering support to customers on the steps necessary to ensure work is done well is also a valuable component of the Company's DSM programs.

Many other utilities are moving away from offering a specific list of service providers for several important reasons:

- Research has shown that customers tend to refer to alternative online resources (e.g., angleslist.com) or word-of-mouth recommendations when researching qualified contractors, rather than the utility referral network.
- Maintaining a robust list of qualified contractors is a costly process that requires constant diligence to verify contractors meet the qualification standards required to merit a referral.
- Utilities have become less and less willing to take on the inherent risk associated with the perception of endorsing services over which the utility has no control.

Conclusions

The Dealer Referral Network provides two important functions: it offers support and education to customers on how to find high-quality service providers and it serves as a platform for informing contractors about program activities and changes. However, the Company also has many mechanisms in place to provide these functions through its individual programs. It is not necessary to duplicate this support through the Dealer Referral Network.

Additionally, because the Dealer Referral Network does not produce energy savings and, given the potential costs and limited benefits resulting from providing specific dealer referrals, there is no reason to keep or modify the program beyond 2014.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Dealer Referral Network program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Allow the Dealer Referral Network program to expire in 2014 as planned.
- Continue to offer customer support and education on how to find high-quality service providers through individual programs.
- Continue to work actively to engage trade allies and provide them with comprehensive information and regular updates on energy-efficiency programs through a combination of program support functions and the Customer Education and Public Information program.

Commercial Demand Conservation

Program Description

The Company launched the Commercial Demand Conservation pilot program in the spring of 2012 in order to offer additional energy-savings opportunities to commercial customers and to gauge these commercial customers' interest. The pilot was limited to 10 MW demand reduction and was offered on a first-come, first-served basis to all Company commercial customers with a load of at least 200kW. Despite the 10MW limit, the Company developed a diverse portfolio of customers.



The Company worked with a qualified program implementation contractor, which designed the pilot using an interruptible model. This model relies on customers voluntarily reducing load for curtailment events that are called by the utilities during times of system peak conditions or high market prices. Each customer that participated was required to commit to achieving a minimum demand reduction of 50kW when called upon to do so by the Company.

The Company's program implementation contractor installed two-way communication devices at participating customers' facilities so that the Company could monitor energy decreases using the cellular network. Customers were provided with software, which allowed them to access real-time energy usage and consumption history.

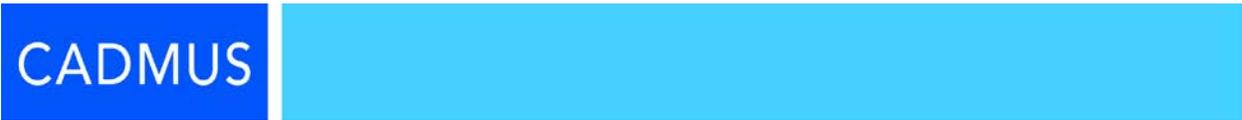
Customer incentives were based on kW savings at \$25/kW-year saved. The rebate was adjusted by the percent of the customer's savings goal achieved. Customers that achieved 100% of their curtailment goal received the full \$25/kW-year incentive. Customer that fell short received a percentage of the \$25/kW-year incentive, equivalent to the portion of the goal achieved.

The Company indicated that demand conservation is a priority over energy-efficiency savings, as it seeks to manage system constraints. Nonresidential demand conservation programs can be a very effective method for utilities to manage system peaks, and some utilities are able to reduce demand by significant margins during peaking events.

Best Practices

Cadmus research industry best practices common for nonresidential load control programs and compiled the following list of suggested industry-established best practices for the Company to consider.

- Provide capability to support a range of load shape and customer cost management objectives.
- Require participants to make a minimum load curtailment commitment.
- Supply participants with energy management tools.
- Offer adequate incentives to motivate customer action coupled with penalties for failure to achieve contracted curtailment.
- Use messaging that promotes the shared benefits of grid reliability, delayed need to build new generation, and lower peak power costs.
- Along with incentives, promote the program's other benefits such as energy management tools, interval meters, etc.
- Meet with new or prospective participants to explain the program features, protocols, and enabling tools.
- Provide customers with as much advanced notice of events as possible. A minimum of two hours is recommended.
- Use multiple customer notification methods (e.g., phone, e-mail, text, and pager).



- Conduct at least one interruption each year, even if reliability and peak conditions do not warrant one, to maintain the program's integrity and ensure that participants understand the program protocols.

The Company’s Commercial Demand Conservation pilot design already incorporates many of these best practices. For example, the pilot includes a diverse group of commercial customers and requires a minimum load curtailment amount of 50kW. Customers are provided with software to help them track their energy use in real time and view energy use history.

The incentive of \$25/kW-year was high enough to interest more customers than the Company could accommodate for the pilot program, which indicates there would likely be additional customers interested in participating if this pilot were to be expanded into a full program.

The Company has called events both years the pilot has been running and, in all cases, notifications were sent to customers via text and e-mail at least one hour prior to the event. The implementer is available throughout the event to support customers as needed.

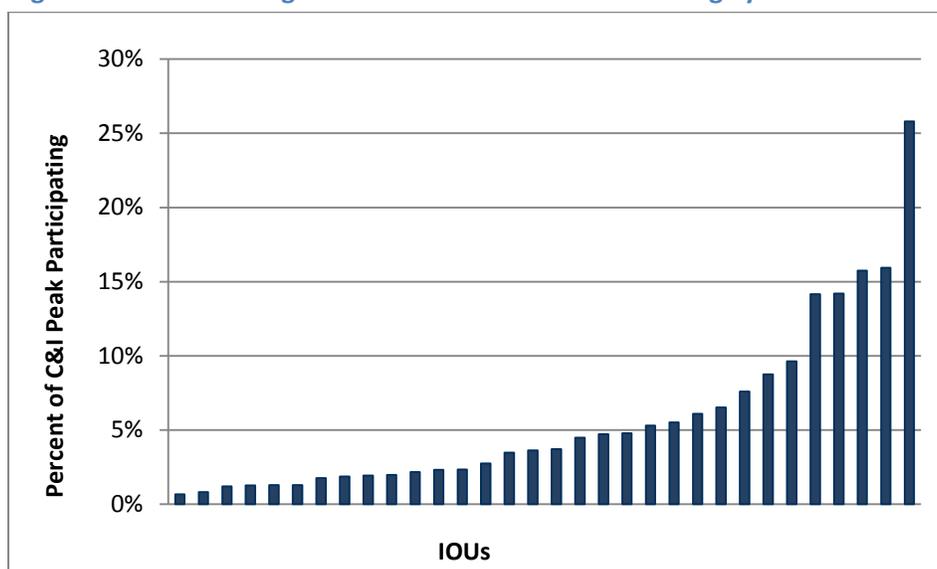
Research Results

Cadmus conducted additional research to address a specific question dictated by Company staff. This research question is listed with a summary of our findings.

1. Should pilot be turned into a program? What potential exists?

Through researching similar programs in other jurisdictions, Cadmus found that other utilities achieve approximately 1% to more than 25% of eligible nonresidential demand reductions during a system peak hour as shown in Figure 3.

Figure 3. Percent of Eligible Nonresidential Demand During System Peak Hour





Conclusions

Considering the Company's need to manage peak load and its commitment to energy demand reduction, incorporating a nonresidential load control program into its DSM portfolio is a viable strategy for achieving these objectives. The Company's Commercial Demand Conservation pilot design already incorporates many industry-established best practices and is based on a proven industry model that should be preserved if the Company moves forward with developing the pilot into a full program.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the implementation of a nonresidential load control program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Establish the Commercial Demand Conservation as a full, permanent program, transferring the program design features already instituted in the existing pilot program model.
- Continue working with an experienced demand conservation implementation contractor and offer the program to all commercial customers.
- Once implemented, monitor program participation, growth, and satisfaction closely, and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Home Energy Rebates

Program Description

The Home Energy Rebates program, launched in the spring of 2012, offers rebates to residential customers who purchase and install energy-efficient equipment such as ENERGY STAR appliances, energy-efficient HVAC equipment, and window film. To participate, customers either call customer service or request an application by signing up online at the Company website. The Company mails the application with some of the required site-specific data pre-populated for the customer's convenience. After purchasing and installing the equipment, the customer returns the completed rebate application along with the proof of purchase to the Company.

Eligible equipment includes:

- Central air conditions
- Air source heat pumps
- Heat pump water heaters
- ENERGY STAR dishwashers
- ENERGY STAR refrigerators
- ENERGY STAR freezers
- ENERGY STAR clothes washers

- Window film or new windows with film applied

The program is popular with customers and has been extremely successful so far, meeting or exceeding its goals before the end of its first year and meeting its 2013 targets by early summer. The Company uses diverse marketing channels such as brochures, bill inserts, billboards, promotional materials in retail stores; events; e-mail; web-based advertising; newspaper, magazine, television, and radio advertising; and social media such as Facebook and Twitter.

The Company conducts outreach to trade allies by giving retailers the option to use utility-branded promotional materials and contacting HVAC contractors through phone calls, e-mail, and office visits. Although contractors and retailers know about the program and are encouraged to share information with customers, they do not have access to applications; customers must request those themselves.

Best Practices Gap Analysis Results

Cadmus compared the Home Energy Rebates program to industry best practices that are common for residential rebate programs. Table 9 presents the results of this analysis.

Table 9. Residential Prescriptive Rebate Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Spread implementation dollars among multiple implementers who may also be distributors or contractors.	Yes	The Company is partnering with retailers to help promote program-eligible energy-efficient equipment.
Incorporate stakeholder feedback into the implementation planning process.	Yes	The Company consulted with its DSM advisory group prior to launching the program.
Measures and Incentives		
Offer dealer and installer incentives (such as 5% to 10% of customer rebate per unit) to encourage program promotion by trade allies.	No	Currently incentives are offered only to customers.
Allow customers to assign incentive dollars to installation contractors.	Partial	On a limited basis, the Company allows customers to assign incentives to low income organizations that facilitate program participation for limited income customers.
Coordinate eligible measures and incentives among regional utility programs to ensure continuity and reduce customer confusion.	Partial	The Company's programs offer consistent measures and incentives, but the two utilities do not coordinate with other providers. A majority of other utilities offering programs in Kentucky are electric cooperatives.
Minimize response time for customer inquiries and applications.	Yes	Customers typically receive rebate checks within one to two weeks of submitting an accurate application.



Best Practice Elements and Innovations	The Company	Details
Marketing and Education		
Leverage ENERGY STAR® brand, marketing materials, and other resources.	No	There is no co-branding with ENERGY STAR at this time.
Use a diverse marketing strategy that leverages multiple media.	Yes	Marketing includes brochures; bill inserts; billboards; in-store marketing; events; e-mail; web-based advertising; newspaper, magazine, television, and radio advertising; and social media such as Facebook and Twitter.
Build strong communication channels with retailers and use point of purchase (POP) program materials and in-store rebate applications.	Partial	The Company are building relationships with retailers and using POP program materials, but applications are not available in stores at this time.
Know the target customers and tailor messaging to that audience.	No	There is no customer segmentation at this time.
Educate program participants about the benefits and features of recently purchased rebated energy-efficient measures, specifically around ways to optimize energy savings in the use of the equipment, and future technology adoption or behavior.	No	Though the Company does include general education pertaining to energy efficient appliances, and the available rebates, the Company does not include equipment-specific educational materials targeting customers who have recently purchased a rebated energy-efficient measure, in their marketing strategy at this time.
Program Delivery and Implementation		
Allow retail partners to submit rebate applications on behalf of customers.	No	Customers must submit the rebates forms themselves to receive incentives.
Use simple rebate forms, participation process, and program rules.	Partial	The Company use simple rebate forms; however, applying for rebates requires customers to request an application, wait for it to be mailed, and then submit the application.
Offer customer assistance in preparing and submitting program applications.	Yes	Customer service assists with application process as needed.
Provide contractor training on proper installation practices.	No	The Company does not provide technical or equipment performance training to contractors at this time.
Tracking and QC		
Track all data required to measure program performance.	Yes	The Company tracks all necessary data.
Perform installation inspections to ensure quality of work is maintained throughout the program.	Partial	The Company does not perform verification visits at this time but plans to implement this process in the near term.

The Company designed the Home Energy Rebates program using many industry best practices. For example, the Company partners with retailers to promote the program and sales of energy-efficient equipment. Rebate processing is quick, often taking no more than one to two weeks for customers to receive their rebates after submitting the required paperwork.

The Company uses mixed-media marketing including brochures; bill inserts; billboards; in-store marketing; events; e-mail; web-based advertising; newspaper, magazine, television, and radio advertising; and social media such as Facebook and Twitter.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. Each research question is listed below with a summary of our findings.

1. Should additional measures, such as thermostats or dehumidifiers, be added at this time?

Cadmus reviewed the measure gap analysis for other cost-effective measures that could be added to this program. We found programmable thermostats to be cost-effective and have good potential; however, dehumidifiers are not cost-effective and have low technical potential. We found that the following measures have medium or better potential and are cost-effective: faucet aerators, exterior doors above R-10, electronically commutated motor (ECM), and quality installation for electric HVAC measures. Low-flow showerheads have also been shown to be cost-effective and have some available potential but on the low side of our rankings. Table 10 shows these results.

Table 10. Gap Analysis Results

Measure	Incremental Measure Cost	Achievable Potential	
		Energy Saving	Demand Reduction
Programmable Thermostat, Electric	\$100	High	Med
Faucet Aerator - Tier 2, electric	\$18	Med	Med
Low-Flow Showerhead, electric	\$119	Low	Low
Quality Installation – CAC	\$413	High	High
Quality Installation – Heat Pump	\$263	Med	Med
ECMs	\$120	Med	Low
Exterior Door - Above Code (R-10)	\$194	Med	Med

Faucet aerators do not lend themselves to a downstream rebate, since their low incremental cost would support only a minimal incentive and the cost of rebate processing may exceed the rebate itself. The Company, like most utilities, already uses a direct installation approach to deploy faucet aerators, and showerheads through the WeCare and Home Energy Analysis programs, and programmable thermostats through the WeCare program.



Cadmus also reviewed potential and cost-effectiveness for the measures currently offered through the Home Energy Rebates program. Many of the measures currently offered have medium or high potential, but they were not cost-effective in the gap analysis. In fact, because the Company has very low avoided costs, which adversely affect cost-effectiveness results, we found that few residential measures in the entire portfolio of measures we analyzed in the potential study were cost-effective.

It is important to note that Cadmus' potential study relies on a series of assumptions and a theoretical modeling exercise to develop benefit-cost ratio results. So, while this exercise resulted in few measures being cost-effective, the Company has found its Home Energy Rebates program to be cost-effective and extremely successful for the past couple of years, which demonstrates that this type of analysis should be considered as a secondary resource to actual program performance data.

2. Should the budget be increased? What can be expected for participation increases over time?

Given the success of this program, it is critical that the Company maintains a budget that supports all rebates and avoids gaps in available funding, which can manifest as program stops and starts or waiting lists for rebate applicants.

It is typical for newer programs and/or new measures to ramp up gradually over the first several years as awareness increases and contractors begin to understand and promote program benefits to their customers. Participation rates can be difficult to predict since they vary by measure and can be affected by market saturation, equipment useful lives, and other factors. As the Company's programs accumulate data, measure-level participation and escalation rates over several years can be analyzed and used to inform budgetary allocations going forward.

3. Are there other aspects to consider that can make this program even more successful?

Cadmus reviewed three primary operational characteristics that frequently have a direct impact on program success: 1) available measures and incentive levels, 2) marketing, and 3) potential program barriers. We address each of these categories below.

Measures and Incentives

As discussed above, the Company's Residential Energy Rebates program already offers a good cross-section of measures with 20-year economic potential. We identified only four additional measures that offer good cost-effective achievable potential with incremental costs that are high enough to justify deployment in a downstream rebate program. These measures are programmable thermostats, exterior doors above R-10, ECMs for furnaces, and quality installation (QI) for cooling systems (central air conditioning and heat pumps).

Some other utilities offer QI training to contractors and incentives to either customers or contractors who install HVAC equipment using ENERGY STAR Quality Installation standards. Providing QI training and customer-facing educational materials encourages contractors to engage with customers about the program, incentives, and benefits of buying and installing energy-efficient equipment and increases the

savings from energy-efficient equipment installs. However, developing a market for QI can be costly and take several years to gain traction with contractors. Given the current success of the Residential Energy Rebates Program, adding this step may not be necessary now, but could be considered in the future, if needed to generate additional savings from the program.

Cadmus also reviewed the incentive levels for the Company's current portfolio of residential measures. For HVAC measures, incentive levels can vary significantly across utilities; in general, the Company's incentive levels are on the low side compared to those of other utilities and also below the 50% of incremental cost threshold that Cadmus identified as the sweet spot to encourage customer participation based on survey results. The Company's incentives are roughly in line with those of other utilities for appliance measures and water heaters. Table 11 provides incentive level benchmarking for the measures the Company currently offers in its Residential Energy Rebates program.

Table 11. Incentive-Level Benchmarking for Home Energy Rebates Program Measures

Measure	The Company	Xcel Energy	Baltimore Gas and Electric	Rocky Mountain Power	Interstate Power and Light
Central AC >SEER 14	\$100 + \$100 each additional SEER	\$250 (SEER 14.5), \$350 (SEER 15), \$500 (Seer 16)	\$200 (SEER 14.5), \$400 (SEER 15)	\$150 (SEER 15)	\$200 (SEER 14.5); \$350 (SEER 15); \$500 (SEER 16)
Air Source Heat Pump >SEER 14.5	\$100 + \$100 each additional SEER	N/A	\$200 (SEER 14.5), \$300 (SEER 15), \$500 (SER 16)	N/A	\$300 (SEER 14.5); \$400 (SEER 15)
ENERGY STAR heat pump water heater	\$300	N/A	\$350	\$300	\$300
ENERGY STAR clothes washer	\$75	N/A	\$50-\$100	\$50	N/A
ENERGY STAR dishwasher	\$50	N/A	N/A	\$20	N/A
ENERGY STAR Freezer	\$50	N/A	\$75	\$20	N/A
ENERGY STAR refrigerator	\$100	N/A	\$100-\$150	\$40	N/A

Marketing

Cadmus conducted a cursory review of the Company's marketing channels and messaging for the Home Energy Rebates program. We found that the Company uses diverse marketing and outreach channels that combine mass market media (web-based advertising, newspaper, magazine, television, and radio advertising), direct consumer outreach (direct mail, e-mail, contractor phone calls and e-mail), and grassroots, community-based marketing strategies (attendance at community events, social media). The Company's messaging strategy is generally in line with known consumer motivators and includes a strong call to action. The success of the Company's programs to date is a testament to the effectiveness of its marketing.



Potential Program Barriers

The Company's process for customers to obtain a rebate application may be a barrier to participation for some customers. Similar programs in other jurisdictions make rebate applications available to contractors and retailers as well as customers, often online in a simple downloadable format.

The Company customers must follow a two-step process. First, they request an application (either online or by telephone) then wait to receive it in the mail; second, they must complete the application and submit it with their purchase documentation. The online application request requires customers to set up a new user registration and provide a social security number. Industry research has shown that each additional step customers must take to participate in a program can be a barrier to participation. As noted in Table 9 above, best practice calls for making the rebate application process as simple as possible and with different options for obtaining applications.

1. Would adding the HVAC Test and Tune-up program to the Home Energy Rebates program save on costs?

As discussed in the Residential and Commercial HVAC Test and Tune-up section, Cadmus found examples in other jurisdictions of HVAC tune-ups that are successfully offered as measures within prescriptive rebate programs; however, HVAC tune-ups require several program-specific delivery and administrative tasks that are consistent regardless of where a program is housed within a portfolio. Rolling the HVAC test and tune-up program into the Home Energy Rebates program could cut down on some administrative costs, but the impact would likely be relatively small compared to the program's overall cost.

Cadmus also found that the Company's incentive for HVAC tune-ups is approximately double those offered by similar programs in other jurisdictions. Thus, while reducing incentives is a potential cost-saving measure, lower incentives could have the effect of reducing participation, thereby offsetting available savings. Most program implementation and delivery costs would not be affected by shifting HVAC tune-ups to the Home Energy Rebates program.

The primary functions of an HVAC tune-up would not change and the program would continue to incur the majority of such implementation costs as contractor management, verification and quality control, training, marketing, incentive processing, tracking, and evaluation.

Conclusions

Using many industry best practices, the Company's Home Energy Rebates program has been very successful in the short time since it launched, exceeding goals for 2012 and already meeting targets for 2013. The program is popular among customers and the Company will likely need to increase its program budget to keep up with demand.

As the program has been exceeding its savings goals and budget allocations with its current measure offerings, adding new measures to the program is not necessary at this time. However, Cadmus' gap analysis revealed a few additional measures that are cost-effective and have available savings potential

as well as large enough incremental costs to justify a downstream incentive approach that the company may wish to consider as the program and its market evolve. These measures are programmable thermostats, R-10 exterior doors, ECMs, and quality installation for cooling systems. Faucet aerators and low-flow showerheads also offer cost-effective potential but, due to their low cost, are typically deployed using a direct install mechanism; this is consistent with the Company's current approach.

Cadmus' review found that the Company's incentive levels for most measures are in line with those offered by other utilities. We identified one operational procedure—a two-step process for accessing and submitting incentive applications—that may present a potential program barrier.

While future participation rates are difficult to predict because participation rates can vary by measure and be affected by market conditions, saturation, and other factors, the Company can use ongoing analysis of measure-level participation and escalation rates over time to inform future budget allocations.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Home Energy Rebates program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Increase the program budget as necessary to maintain sufficient funding to cover all program applications and avoid gaps in program operations.
- Continue to monitor participation and savings results and assess the potential benefits and feasibility of adding cost-effective measures as needed to support program goals.
- Consider making rebate applications more readily available online and through contractors and retailers.
- Continue to monitor program participation, growth, and satisfaction closely, and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Commercial Energy Analysis

Program Description

The Company launched the Commercial Energy Analysis program in the mid-90s primarily to promote energy education, and it has implemented several modifications over the years to serve the needs of its commercial customers. In its 2015-2018 program plan, the Company anticipates combining multiple commercial program options under a single umbrella, designed to offer commercial customers technical support and incentive options for both existing and new construction. This adjustment is intended to streamline the participation process for customers, improve program cost-effectiveness, and increase audit-to-rebate conversion rates.

The Commercial Energy Analysis program umbrella includes the following components:



On-site Assessments

The Company has historically offered an assessment of customers' facilities, including an inventory of installed equipment and usage characteristics. The Company partners with a third-party implementer to manage assessments. The implementer sends a detailed report to participants within 15 business days of the audit; this report includes the audit results, a usage summary, recommendations, energy savings estimates, and links to commercial rebates.

To improve cost-effectiveness, the Company is currently investigating transitioning the onsite assessments to a co-payment model in which customers pay a portion of the assessment cost up front, and those who install a minimum number of recommended measures qualify for a rebate to cover the balance.

As an alternative to onsite assessments, the Company is investigating adding more sophisticated audit and modeling tools to its website and broadening the technical support resources offered by the Business Center. In conjunction with these tools, the Company expects to improve advertising with messaging that directs targeted commercial customers and participating trade allies to the website, and ultimately to improvements and rebates offered through the Commercial Energy Analysis program.

Commercial Energy Rebates

The Company offers prescriptive incentives for lighting, motors, air conditioning, chillers, and drives. In 2012, the Company added a custom incentive option to its commercial portfolio. Commercial customers can receive \$100 per kW of avoided capacity up to \$50,000 per facility, per year. So far, universities and schools have been the largest participating customer segment; hospitals have recently started to participate.

Over the past few years, the Company has continued to enhance the program by building a trade ally network. While the Company struggled to fully allocate its budget for this program component, these modifications have improved participation, allowing the Company to increase program spending each year and, in 2013, the program hit the \$2 million spending target. To further encourage participation, the Company has made rebates available retroactively to 2008, if a customer can provide the necessary paperwork.

Commercial New Construction

The Company is investigating adding a Commercial New Construction program to its portfolio in order to provide comprehensive options for both existing and new construction facilities. The Company asked Cadmus to conduct research on industry best practices and implementation strategies for its consideration during the design phase. In this section, we provide a high level summary of a commercial new construction program structure and key features for the Company's consideration.

The Company markets the Commercial Energy Analysis program through a variety of channels, including direct mailings, newspaper advertisements with stories and testimonials, one-on-one networking,

outreach through major account representatives and the Business Center, as well as sponsoring and attending community events and visiting the offices of commercial customers.

Best Practices Gap Analysis Results

Cadmus compared the Commercial Energy Rebates program component to industry best practices common for commercial rebate programs. Table 12 presents the results of this analysis.

Table 12. Commercial Prescriptive and Custom Rebate Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Maintain flexibility to allow program managers to make program changes and/or address problems as they arise, but ensure that all stakeholders are given notice of program changes and ample time to respond.	Yes	The Company monitors the program closely to ensure changes are made as needed while giving stakeholders enough advance notice to prepare for such changes.
Clarify requirements for implementation through the application and contracting process.	Yes	The implementer provides all necessary information on requirements to customers as part of the enrollment process.
Measures and Incentives		
Allow trade allies to submit rebate applications on behalf of customers.	Yes	Implementer can submit rebate applications for customers.
Maintain availability of program funds throughout the year.	Yes	Program funds have been available year-round every year since the program launched in 2008.
Create program ties with other commercial offerings to provide interested customers with a comprehensive package of services.	In Progress	The Company is considering combining this program with the Commercial Energy Analysis program as well as a Commercial New Construction component.
Allow customers flexibility to install a wide range of equipment and system upgrades.	Yes	Customers have many options between the prescriptive offerings and custom model.
Marketing and Education		
Draw on relationships (e.g., key account managers, industry associations, contractors, distributors) and use opportunities for one-on-one marketing outreach (phone contact, lunch-n-learns, etc.)	Yes	Major account representatives are trained to discuss the program with the Company's larger commercial customers, and the Company attends and sponsor events to interact with commercial customers one-on-one.
Keep contractors and trade allies well informed about program features and changes through multiple outreach tactics.	Yes	The Company informs trade allies of program changes through presentations.
Provide ongoing, active education and outreach to customers about the benefits and features of energy-efficient equipment.	Yes	Marketing includes newspaper advertisements, radio, social media, one-on-one networking, outreach through major account representative and the Business Center, and community events.



Best Practice Elements and Innovations	The Company	Details
Program Delivery and Implementation		
Build and maintain strong communication channels with trade allies.	Yes	The Company has been building communication channels with trade allies for several years.
Use simple rebate forms and program rules that are accessible on line.	Yes	Rebate forms and program rules are available online.
Minimize documentation requirements and publish all program information on the Internet.	Yes	All program documentation is available on The Company's website.
Offer technical and program assistance to customers and trade allies (e.g., through a program "hotline").	Yes	The Business Center and major account representatives are trained to support customers throughout this program.
Tracking and QC		
Specify data requirements needed to measure program results.	Yes	Data requirement are laid out in the rebate and application documentation.
Conduct regular tracking system checks for accuracy and completeness.	Yes	All applications are reviewed and checked for completeness.
Conduct regular quality checks on all participating trade ally installations. Decrease the number of site inspections as a trade ally proves its capabilities.	Partial	Quality checks are done on all larger projects and a random sample of smaller projects. There is no system in place currently to manage site visits based on contractor performance.
Conduct pre- and post-installation inspections for all large projects with highly uncertain baseline conditions and/or savings.	Partial	Only post-installation inspections are done on all large projects.
Perform process evaluations to gain insights and feedback on the program's effectiveness and to inform future program enhancements.	No	A process evaluation has not been performed yet.

The Company designed the Commercial Energy Rebates program using many industry-established best practices. For example, the Company monitors the program closely, making changes as needed, while ensuring that stakeholders and customers stay current on the program offerings through presentations and contact from major account representatives.

Despite changes made over the years, program funds have always been available year round. The implementer, both vetted and certified, offers customers as much support as possible, including providing all necessary information on program requirements up front, as well as on line, and submitting rebate applications for customers as needed. The program offers customers a variety of options through the prescriptive and customer track, and the Company is considering adding a new construction component as well. The implementer conducts quality assurance checks on all large projects as well as on a random sample of smaller projects.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. Research questions are listed below under each program component with a summary of our findings.

Commercial Assessments

1. Can savings be claimed through the audit?

Because an audit is, by definition, simply an assessment of operations and savings opportunities and does not involve energy-efficiency upgrades, it is not possible to claim savings. Our review of other similar programs offered by peer utilities revealed no examples of programs claiming savings for the audit itself. However, many commercial audit/assessment programs do include direct install measures as part of the audit process, which allows the utility sponsors to claim savings for the installed measures.

2. Would an online audit work? Are there examples?

Cadmus found that very few utilities offer an online commercial audit program component. Of those that do, the online audit is typically paired with an onsite audit option. Because significant variables exist within commercial construction, the online tool can be complicated to use and results offer limited customizability and generic recommendations.

One of the primary benefits of such a component would be to provide the Company with contact information and building data for prequalified interested potential program participants to use for targeted direct outreach and a screening tool for specific program and project opportunities.

3. Should the program be opened to all contractors?

Currently, the Company offers audits to all commercial customers through one implementer. There are benefits and drawbacks to opening this sort of program to all contractors. The benefits include:

- Potential to leverage contractors for program promotions.
- Boost to local economic development.
- Increased rapport and satisfaction with trade allies.

The drawbacks can include:

- Less accountability with contractors and higher risk of poor quality work.
- Contractors have diverse skills and areas of expertise and typically assess systems and provide recommendations that align with their primary business offering (e.g., lighting contractors tend to recommend lighting upgrades but ignore HVAC).
- Greater cost to control and monitor program quality.
- Requires substantial commercial auditor community to succeed.



Although opening the market to all contractors to implement measures such as those offered through the Commercial Energy Rebates program has some benefits, this change would need to be handled carefully. For example, the Company would need to implement controls such as contractor training and explicit rules to manage the variable costs and practices used in commercial energy audits. Other utilities' programs have set limitations such as a cap on incentives, supplying checklists of required and covered activities to contractors, implementing QC visits, and developing requirements for trade ally participation. These participation requirements include requiring program training on quality protocols; appropriate licenses, insurance, and certifications; a contractual relationship covering confidentiality protections and program rules; and other measures to ensure contractor quality and to reduce risk.

Commercial Energy Rebates

1. What other commercial customers should the program target?

So far, universities have been the largest participating customer segment; schools and hospitals are just starting to participate. These large facilities offer significant energy savings and are very good program targets, particularly for custom projects. In Cadmus' potential study, we found significant natural gas potential in the healthcare sector in particular, with more modest potential for schools (5% electric; 7% natural gas). Cadmus potential study found additional significant economic potential in the large retail segment (25% electric; 17% natural gas), followed by large and small offices (11% each electric potential), grocery (10% electric potential), and lodging (13% natural gas potential). Programs in other jurisdictions have had success targeting grocery stores, both individual and chain stores with lighting, space conditioning, and refrigeration; major retailers and chains; the food service industry; large office buildings, mainly with lighting; and municipal buildings.

To address a large and traditionally underserved subset of the commercial sector, many utilities have begun to target small commercial customers. The small commercial segment is among the hardest to reach with utility energy-efficiency programs and one of the last customer sectors across the country to offer significant, largely untapped energy-efficiency potential. Some utility programs are exploring new program models that rely on an active direct outreach, installation of a range of appropriate measures, aggressive incentives on highly cost-effective lighting measures, and high levels of technical support, managed by experienced third party vendors. In many jurisdictions, this model has proven to be cost-effective and produce significant energy savings.

This type of program can provide small commercial customers with a variety of benefits including information about their building's energy use and ways to save energy from trained energy-efficiency professionals, increasing the comfort of their facility and in turn their staff, savings through larger whole-facility lighting retrofits, and information about additional energy savings opportunities through the Company's other utility energy-efficiency program offerings.

As part of its continuous program development process, the Company has created the Administrative and Development fund, which, along with being used for administrative functions,

funds the research and development of new pilots and program offerings for customers. The Company is continuously looking for opportunities to enhance its programs by offering new technologies, improving its delivery mechanisms, or incorporating new market intelligence into its portfolio. The Company may wish to explore offering a new program component focused on small commercial facilities as part of its research objectives.

2. Should additional measures be added to the program?

Cadmus reviewed the measure gap analysis for other cost-effective measures that could be added to this program. Cadmus' potential study revealed that several measures already offered by the program are cost-effective and offer medium or better achievable potential. These measures are good candidates for focused promotion to capture program savings. There are additional measures that are cost-effective and offer medium or better achievable potential that are not currently offered through the program. An overview of potential measures is shown in Table 13.

Table 13. Commercial Cost-Effective Measures with Medium to High Potential

Measure Currently offered	20-year Achievable Potential		Benefit-Cost Ratio
	Energy Savings	Demand Reductions	
Anti-Sweat (Humidistat) Controls	Low	Med	3.24
Case ECM	Low	Med	1.90
Case Replacement Low Temp	Low	Med	4.27
Lighting Interior - Screw Base LED - Above Standard ¹	High	High	36.16
Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Low	Med	2.24
Motor - Pump & Fan System - Variable Speed Control	High	High	3.84
Compressor VSD Retrofit	Med	Med	2.80
Insulation - Duct	Low	Med	3.50
Occupancy Sensor Control	High	Med	0.90
Measure Not Currently Offered	kWh	20-year Technical Potential kW	Benefit-Cost Ratio
Direct Digital Control System-Installation	High	High	2.26
Network PC Power Management	High	Med	1.98
Windows - High-efficiency	Med	Med	141.91
Hotel Key Card Room Energy Control System	Med	Med	2.59
Cool Roofs	Med	Med	1.50
Achievable potential reflects a 20-year outlook during which the cost of LED technology is expected to come down significantly, influencing increasing cost-effectiveness and achievable potential over the planning study horizon.			

In evaluating conditions for the potential new prescriptive measures, it will be important to consider if the market demand justifies the addition. Some measures, such as hotel key card control systems may not justify the administrative cost of offering it as a prescriptive application if demand is not sufficient to



support the measure; however, approaching hospitality industry target clients with a custom measure package may offer a viable alternative to a prescriptive offering.

Commercial New Construction

1. What program best practices should the Company consider in planning for the new construction program component?

Cadmus researched industry best practices common for nonresidential load new construction programs and compiled the following list of suggested industry-established best practices for the Company to consider.

- Maintain active communication with implementation team and stakeholders.
- Maintain flexibility to respond to changing market conditions and unforeseen events.
- Ensure the implementation team is technically proficient in high-performance commercial construction practices.
- Get involved as early in the design process as possible.
- Structure participation requirements to discourage the design team from cutting energy-efficiency features during value engineering.
- Provide participation options that are well-designed and well-communicated to project stakeholders.
- For projects involving DOE2 simulations, establish definitive base case and final scenarios.
- If incentives are performance-based, incorporate disincentives to inflating savings via exaggerated operating hour estimates, etc.
- Develop a baseline document that provides guidelines for determining appropriate benchmark energy impact and incremental cost calculations.
- Choose trade ally outreach over mass marketing techniques for program marketing.
- Promote customer benefits first, focusing on economically quantifiable benefits over the project life cycle.
- Define and identify the key information needed to track and report early in the program development process. Track every project through every phase of construction.
- Develop accurate algorithms and assumptions on which to base savings estimates.
- Build in rigorous quality control screens for tracking data entry.
- Clearly define qualifying measures and their expected impacts as well as post-inspection policies and procedures.

Best practice commercial new construction programs typically take a whole-building approach or blended whole-building and systems approach to energy efficiency. These programs include a strong focus on integrated design and design assistance and building relationships with the full range of project stakeholders, and they entail a long-term commitment from both the project and program teams.

Additionally, new commercial construction projects typically target key system components such as lighting, HVAC, and shell improvements and focus less on refrigeration, motors, and process improvements.

Conclusions

While commercial energy assessments have been meeting the Company's audit goals since its launch in the mid-1990s, its commercial energy rebates component has fallen short. The Company has continued to build the Commercial Energy Rebates program since its launch in 2008 by working to build a trade ally network and adding custom measures in 2012. These modifications have improved participation over the years, and the program did expend the allotted budget for the first time this year.

In its 2015-2018 program plan, the company anticipates making additional program changes in its efforts toward continuous improvements. These potential program changes include:

1. Combining commercial energy assessments and commercial energy rebates program under one umbrella program in order to offer customers a more seamless participation process;
2. Emphasizing online audit tools as an alternative to onsite audits.
3. Offering incentives for onsite assessments as a customer rebate, only available to customers implementing eligible energy efficiency projects.
4. Adding a new commercial new construction component to the program.

Cadmus found that the Company implements the program using many industry-established best practices. Although Cadmus found that very few utilities offer a stand-alone online commercial audit program, allowing customers to apply for rebates to offset a portion of their own facility audit costs when they install energy efficiency measures is an accepted industry best practice. The online audit tool also provides a marketing benefit as it will allow the Company to capture contact and facility information for customers who express an interest in efficiency. As it seeks to grow and expand the program, there may be new opportunities to explore by targeting specific commercial segments with customized marketing campaigns, offering technical services and incentives to small commercial customers on a pilot basis, and/or considering the potential costs and feasibility of adding new prescriptive technologies to the program.

Many utilities also offer successful nonresidential new construction programs that provide cost-effective energy savings and help establish higher-performing building practices among commercial architects, engineering firms, and design/build contractors. As the Company has developed a portfolio of effective DSM programs, including a highly successful residential new construction program, and established itself as a leader offering efficiency programs in Kentucky, it is well positioned to move into the commercial new construction sector. As discussed in previous chapters, this program could be offered as a component under the commercial custom rebates track in the Commercial Energy Analysis program.



Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Commercial Energy Analysis program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Integrate the commercial assessments, commercial rebates, and new construction program components under the Commercial Energy Analysis program umbrella.
- Continue to offer onsite audits under the Commercial Energy Analysis program for those customers that install energy efficient commercial projects.
- Offer an online audit component that involves building more sophisticated audit and modeling tools, allocating additional resources to the Business Center, and increasing marketing to commercial customers. Use the online audit tool to direct commercial customers toward potential prescriptive upgrades or to prequalify them for onsite audits as appropriate.
- Add a Commercial New Construction component under the Commercial Energy Analysis program. To the extent practical, employ program design recommendations provided in the next subsection.
- Continue to monitor program participation, growth, and satisfaction closely and to implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Customer Education and Public Information and Children's Energy Education Programs

Program Description

The Customer Education and Public Information program planned in 2008 and launched in 2009 has two components: the General Customer Education component and the Children's Energy Education component.

General Customer Education

The General Customer Education component provides general education to all Company customers. The Company uses a variety of outreach channels, including attending customer and trade ally events, sending bill inserts and other mailings, and using web advertising to distribute general information about energy savings actions and to promote the Company's equipment and behavior-based energy-efficiency programs.

Children's Energy Education

The Company territory is divided into four regions, each with a full-time education coordinator who works for National Energy Education Development (NEED) and is dedicated to the Children's Energy Education component. The coordinator delivers teacher trainings, provides on-going support, and coordinates guest speakers and classroom presentations. Each participating teacher attends a full day of

training in his or her region, facilitated by NEED, which covers basic energy concepts. Once trained, teachers receive classroom materials and lesson plans, specifically tailored to each grade level, to implement the curriculum. The curriculum materials not only cover science topics but also correlate to the Common Core State Standards for English/Language Arts/Mathematics.

Children’s Energy Education provides age-appropriate classroom curriculum and materials for kindergarteners through eighth-graders, in which students engage in hands-on activities to learn about energy efficiency both inside and outside the classroom. For example, Student Energy Management Teams use what they learn through classroom curriculum and exercises to perform small energy assessments in their schools and to recommend ways to reduce energy usage. Some teams have also presented the results of their assessments and promoted energy-efficiency awareness at parent meetings and Parent Teacher Association (PTA) meetings.

In addition to providing on-going support to teachers, the NEED regional coordinator tracks program participation, training, and follow-up activities such as the Student Energy Management Teams. The Company has also partnered with the Kentucky Science Center to bring skits and presentations about energy awareness to the schools.

Best Practices Gap Analysis Results

Cadmus compared the Children’s Energy Education component to the industry best practices that are common for school-based energy education programs. Table 14 presents the results of this analysis.

Table 14. School-Based Energy Education Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Work with well-qualified contractors to develop curriculum, visual aids, workbooks and assignments, etc.	Yes	The Company works with NEED, an established energy education organization.
Measures and Incentives		
Energy-efficiency take-home kits may be used as an educational tool and for energy savings.	No	Kits are not provided at this time. the Company does not claim savings from the program.
Provide an incentive to teachers to collect and return student feedback forms.	N/A	Because The Company does not claim savings for this program, no verification is required.
Marketing and Education		
Conduct direct outreach to both teachers and school administrators to solicit their participation.	Yes	Regional energy coordinators visit with each school district each year.
Ensure the marketing messages are audience-specific and include a call to action.	Yes	The Company’s education-specific website includes information for teachers, details about the partnership with the Kentucky Science Center, and a mechanism to ask for



Best Practice Elements and Innovations	The Company	Details
		more information.
Program Delivery and Implementation		
Design curriculum that is fun, engaging, visually appealing, and memorable.	Yes	Based on NEED's 30 years of program delivery experience and market knowledge.
Use contests or challenges to engage kids.	Yes	NEED helps organize friendly competitions between schools at the state and national level, with funding provided by the Company.
Design age-appropriate curriculum and target kids old enough to understand energy concepts and efficiency benefits.	Yes	Targets K-8 th grade students using curriculum designed to support each grade level.
Use a variety of educational materials, activities, and assignments to reinforce curriculum.	Yes	Program includes teacher training, school curriculum, classroom presentations, hands-on learning, and ongoing support.
Assign take-home projects and provide general awareness information for kids to share with their parents.	Yes	Students participate in Student Energy Management Teams, which includes hands-on learning and energy savings presentations at PTA and parent meetings.
Invite guest speakers and community leaders to present in classrooms or at assemblies.	Yes	Works with the Kentucky Science Center to provide skits and presentations, as well as regional coordinator for class demonstrations and guest visits.
Present curriculum in small doses over an extended period following a phased path.	Yes	Curriculum targets K-8 th grade students offering age-appropriate material at each grade level.
Tracking and Quality Control		
Provide and request that students fill out feedback forms identifying the energy-efficiency behaviors they plan to take at home	No	Because the Company does not claim energy savings from this program, feedback on energy-efficiency actions taken is not required.

Children's Energy Education is designed using many industry best practices. For example, the program works with NEED, a well-qualified contractor, to develop curriculum and activities. NEED also conducts outreach to both teachers and school administrators to solicit their participation. Curriculum is well designed, engaging, and age-appropriate. This design, which combines a variety of education materials, activities, and assignments, ensures that energy concepts are introduced at appropriate grade levels and that, each year, program materials and curriculum build on concepts children learned the year before. Children who participate in Student Energy Management Teams are encouraged to take energy awareness concepts a step further by assessing their school's energy use and presenting energy savings concepts to their parents and PTAs.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. Research questions are listed below under each program component with a summary of our findings.

Customer Education and Public Information

1. Is the utility's current level of general education and outreach funding sufficient to support program goals?

The budget for General Customer Education marketing is approximately 10% of the Company's total portfolio budget. Research conducted on similar programs in other jurisdictions indicated that the average allocation for marketing expenditures ranges from 3% to 13% and averages about 6% of total portfolio spending, as shown in Table 15.

Table 15. Energy-efficiency Expenditures as Percent of Portfolio Costs

	Advertising	Planning Design	Program Administration	EM&V	Incentives
Utility 1	3%	1%	7%	2%	86%
Utility 2	3%	10%	11%	3%	73%
Utility 3	4%	9%	17%	2%	68%
Utility 4	13%	2%	36%	3%	47%
Utility 5	11%	0%	42%	2%	46%
Utility 6	3%	1%	7%	2%	86%

At 10%, the Company's budget is a bit higher than the average; however, this spending level may be appropriate given the Company's current level of market maturity in order to accelerate customer awareness of general energy-efficiency concepts and programs.

2. Should the program be expanded to broaden its educational topics, target audiences, and/or delivery strategies?

Utilities across the country offer education programs that encompass a broad range of features. While these programs typically do not engender energy savings directly, efficiency education programs can drive portfolio efficiency savings by:

- Increasing customer awareness of and participation in measure-based programs.
- Increasing customer's overall knowledge of the benefits of efficiency and thus influencing them to incorporate energy-efficient behaviors into their everyday actions.
- Influencing future generations of energy users to ensure efficiency becomes a long-term behavioral norm.
- Promoting efficiency programs to program trade allies so that they, in turn, promote them to their customers.



- Increasing the technical acumen of equipment installers and contractors such that they adopt installation standards that maximize a measure's efficiency at the time of installation.
- Stimulating market transformation to new energy-efficiency technologies and paradigms.

Although the Company offers some technical training to contractors as adjuncts of its measure-based offerings, its education program currently does not target trade allies. There may be an opportunity to expand the education program to increase the technical expertise and awareness of other Company programs among this important target audience.

Through its Residential New Construction program, the Company currently offers a successful training course aimed at increasing builders and contractors understanding of this program and energy-efficient building techniques. (Please refer to the discussion of this program on page 19.)

Although Cadmus does not recommend that the Company continue the Residential New Construction program in the next program period, we note that its educational component has been very effective in driving the new construction industry toward a higher standard of efficiency. There is an opportunity to continue and expand this program to include training for builders and construction industry participants, particularly about the recently adopted 2009 International Energy Conservation Code (IECC) and general energy-efficient residential new construction practices.

Children's Energy Education

3. The Company has not been able to penetrate some school districts, particularly in larger urban areas, where school boards dictate district-level curriculum. Are there examples of ways to overcome this challenge from other jurisdictions that have faced similar barriers?

Despite resistance from some school boards to adopt the Company's Children's Energy Education component, it has been largely successful, demonstrated by the fact that 60% of schools in the Company's territory participate. Since launching the program in 2009, Company staff members have reached out periodically to several larger school boards to promote the program's benefit and encourage their participation. They have also promoted competitions between neighboring school districts and tried to leverage program successes to create more enthusiasm for the program. However, these efforts have largely been unsuccessful.

Cadmus research revealed that this barrier is not uncommon for utilities implementing school-based energy education programs. Most utilities use similar tactics to those of the Company to work with school districts and overcome these barriers and have varying levels of success. The Company's current approach of consistent direct outreach to school districts and demonstrations of the program's benefits is the most likely to succeed over time.

4. The Company is interested in expanding Children’s Energy Education to high schools. Are there examples from other jurisdictions of successful high-school level energy education programs?

The Company’s current program is designed to target each grade level kindergarten through 8th grade, with the most programming focused at the 5th and 6th grade level. Cadmus compared its approach to similar programs in other jurisdictions and found that this approach aligns, or exceeds, the age segments targeted by other education program models. Table 16 provides an overview of grade level-targeting approaches used in other jurisdictions.

Table 16. School-Based Energy Education Program Grade Level Targets

Utility	Program	Grade level targets
Alliant Energy, Iowa	Alliant Energy Kids	Grades 4-5
	LivingWise	Grade 6
PPL Electric Utilities, Pennsylvania	Bright Kids with E-Power	Grades 2-3
	Take Action with E-Power	Grades 5-7
	Innovation with E-Power	Grades 9-12
Consumers Energy, Michigan	Think! Energy	Grades 4-6
Dayton Power and Light, Ohio	Be E3 Smart Program	Grade 5
Vectren, Ohio	Be E3 Smart Program	Grade 5
Vectren Energy Delivery of Indiana	Think! Energy	Grade 5
Pacific Power	Washington Energy Education	Grade 6
Union Light Heat and Power	Kentucky NEED Program	Grade 5
Duke Energy	Energize Indiana Energy Efficient Schools Program	Grade 5-6
Vectren		
Indiana Power & Light		
Indiana Michigan Power		
NIPSCO		
IMPA		

Cadmus research suggested that most utility programs target students between 4th and 6th grades, with a few offering multiple-grade level programs. We identified only one program that has attempted or has been successful at offering energy-efficiency curriculum at the high school level (see PPL Electric Utilities in table above). Program evaluation experts suggest these barriers: lack of new material, lack of student interest, and competition with extra-curricular activities.

5. Are other utilities claiming savings for their school-based education programs, and if so, how?

Many utilities claim energy savings through their education programs, in which they send energy-savings kits home with children. The utilities claim savings associated with the measures in the kits, verified through a follow-up survey that parents fill out. Typical kit measures include CFL bulbs, faucet aerators, and shower heads. Based on our assessment of potential savings conducted for this



analysis, we found that these measures can be cost-effective with medium to high achievable savings potential.

Conclusions

The Company's Customer Education and Public Information program relies on numerous industry best practices to increase customers' awareness of the benefits of energy efficiency and of the actions they can take to save energy. The Children's Energy Education component in particular relies on an experienced organization to develop program content and successfully engages students with age-appropriate information and materials. The General Customer Education component uses a range of outreach tactics to provide general efficiency awareness and promote energy-efficient actions.

However, the program does not currently include an education track that targets program contractors or trade allies with technical or promotional training. Although its Residential New Construction program will likely expire, the Company has an opportunity to continue that program's successful builder training component through its Customer Education and Public Education program.

The General Customer Education marketing budget, set at approximately 10% of the total portfolio budget, is reasonable, though it is on the high end of the 3% to 13% range typically found for other utilities' programs. This slightly higher allocation is appropriate, however, given the relative market immaturity of the Company's customer base.

Children's Energy Education current approach aligns with many industry best practices, including:

- Teachers training
- Age-appropriate curriculum integrated with science, math, and writing
- Guest speakers and teachers
- Hands-on learning and take-home activities organized through Student Energy Management Teams
- Parent involvement and PTA meetings

The Company's Children's Energy Education is successful, engaging with 60% of the schools in its territory. The Company's efforts to engage additional schools in areas where school board control of curriculum presents a barrier to participation has been appropriate. The potential benefits of additional activities to overcome some school boards' resistance may not justify continued investment.

Outcomes

In light of programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Customer Education and Public Information program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Maintain the current budget allocated for General Customer Education marketing in order to continue to increase customers' awareness of the benefits of energy efficiency and actions they can take to save energy.

- Implement a trade ally training track, focusing in the near term on the IECC 2009 standards and on energy-efficient new construction for builders in order to fill the gap left by the expiring Residential New Construction program.
- Maintain current ongoing direct outreach to new school boards to encourage their participation but do not increase the financial investment in these activities.
- Continue to monitor program participation, growth, and satisfaction closely and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Home Energy Analysis

Program Description

The Company has continued to expand the Home Energy Analysis program over the last several years. Starting as an educational program in the mid-1990s, today, the program has evolved to include a subsidized home energy audit, as well as performance-based incentives for electric customers who install energy-efficiency retrofits in single-family and multifamily homes. The Company began offering the performance-based rebates in the spring of 2012, and participation has been slowly ramping up.

A program implementer conducts program audits, which include a blower door test, inventory of appliances and equipment, and a visual inspection of the home's energy consumption characteristics. As part of the audit process, auditors provide direct install measures, which cumulatively account for 10% in overall energy savings. These measures include CFLs, showerheads, faucet aerators, a smart power strip, refrigerator/freezer thermostat, coil cleaning brushes, air sealing, water heater blanket, and hot water pipe wrap. The program covers the majority of the audit cost; customers incur no upfront costs, but a fee of \$25 is added to their utility bill.

Within two weeks of the audit, the program implementer sends the customer a detailed audit report, including a summary of recommended measures tailored to the unique needs of the home. To be eligible for rebates, the customer must work with a contractor to install energy-efficiency upgrades that achieve a minimum of 10% energy savings (beyond those attributed to direct install measures) within 12 months of completing the audit. Once measures have been installed, the implementer returns to verify the home's energy savings. Customers who achieve 10% energy savings after accounting for the direct install measures are eligible for a \$500 rebate; those who achieve 20% savings are eligible for \$1,000.

The program also offers an online tool, available to all residential customers, which provides a summary of customers' usage based on a billing analysis and other household information, such as heating, cooling, and water heating inputs, and generates recommendations for efficiency improvements, energy-saving behavioral tips, and information about the Company's other programs.

The program is designed to encourage customers to take a whole-house approach to saving energy. While the Company has been successful in achieving its audit goals, it has not met its conversion rate

targets for customers who install comprehensive efficiency upgrades. To address this shortfall, the Company has begun to network with Kentucky Housing Corporation to offer low interest financing to customers and has built a sizeable network of Building Performance Institute, Inc. (BPI), contractors.

The Company uses diverse marketing channels, including brochures, direct mail, bill inserts, e-mail blasts, events, and web-based advertising. Messaging has been focused primarily on the audit portion of the program since rebates are a relatively new program component, becoming available only in the spring of 2012 to allow the implementer to get up to speed. The Company plans to ramp up advertising of the program's installation rebates this year in an effort to increase conversion rates going forward.

Best Practices Gap Analysis Results

Cadmus compared the Home Energy Analysis program to industry best practices common for residential audit programs. Table 17 presents the results of this analysis.

Table 17. Residential Audit Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Partner with other utility, state, or local incentive programs to present a unified program to customers.	In Progress	Coordinating program efforts with Kentucky Housing Corporation that provides financing for energy-efficient upgrades.
Use experienced home energy raters to provide onsite energy audits.	Yes	The program Implementer conducts all audits using trained, experience staff.
Make customer follow-up part of the implementation contractor's responsibility	Yes	Implementer conducts follow-up phone calls with customers six and 10 months after the audit.
Measures and Incentives		
Install low-cost direct install measures during audit visit	Yes	Direct installs are included as part of every audit.
Refund some or all of audit cost if customer follows through on recommended actions.	No	The Company subsidizes all but \$25 of the audit cost; no additional incentive is available.
Provide performance-based incentives that offer greater incentives and/or interest subsidies the more measures a customer implements.	Yes	Two tiers of incentive levels are based on achieved savings.
Marketing and Education		
Use consistent messaging directing customers to web-based program information and a central toll-free number.	Yes	Consistent messaging directs customers to web-based information as well as customer service.

Best Practice Elements and Innovations	The Company	Details
Provide tools and resources for customers to take action after the audit, such as tips on how to select a contractor, simple rebate applications (with online submittal options), technical support hotline, tips for do-it-yourself energy-saving opportunities and behavioral actions, FAQs, and other educational materials.	Yes	Audit reports consist of audit results, recommended measures or improvements, tips for do-it-yourself energy-saving opportunities and behavioral actions, and educational information on efficient equipment and home improvements.
Use community-based marketing approaches to create a word-of-mouth effect.	Yes	The Company attends customer and trade ally events to help inform communities of the program.
Make marketing materials and other program information multi-lingual.	No	Marketing and program materials are in English.
Program Delivery and Implementation		
Use customer's actual 12-month billing history to inform upgrade measure recommendations and calculate energy savings.	Yes	Auditors use a minimum of eight months billing history to inform upgrade recommendations and calculate energy savings.
Couple audits with weatherization measure rebates.	No	The program does not include measure-specific rebates; only performance-based incentives are available at this time.
Make audits flow seamlessly into the adoption of recommended measures.	Partial	Implementer conducts follow-up phone calls with customers six and 10 months after the audit, but no other support is offered at this time.
Use an advanced, software-based, energy audit and analysis tool to enter data on site and generate audit reports that can be delivered instantly through e-mail or printed on a portable printer.	No	Auditors prepare reports after the onsite visit and send them to customers within two weeks.
Use simple rebate forms and program rules.	Yes	Application is automatically updated in the system for the customer, after the elect to participate. Customer responsibilities include finding a contractor to install recommended measures and notifying the Company upon installation completion.
Solicit customer commitment to install recommended measures. Offer to help customers develop a phased implementation approach and generate work orders on site for immediate installation measures.	No	Auditors do not request a commitment from customers to install measures. Beyond periodic follow-up reminders, the implementer does not provide customized installation support.



Best Practice Elements and Innovations	The Company	Details
Provide simple, visually appealing energy audit reports that clearly articulate priority measures and estimated energy savings.	In Progress	The audit report format is currently under revision.
Tracking and QC		
Make audit recommendations, including energy saving potential, part of the tracking database.	Yes	Recommended measure type is stored by energy conservation measure ID and value replacement measure ID.
Ensure the database integrates audit participation and results with other program information systems.	Yes	LG&/KU's database tracks program activity at a customer level.
Conduct onsite post installation inspections on a random sample of homes per auditor.	Yes	The implementer conducts verification visits to calculate savings on all homes participating in the performance incentive.
Conduct follow-up phone calls to verify direct install measure installation.	No	Customer follow-up to verify direct install measure installation is not done at this time.

The Home Energy Analysis program is designed using many industry best practices. For example, trained, experienced implementation staff conduct all home energy audits, provide follow-up phone calls six and 10 months after the customer audit, and provide a detailed audit report, which contains recommended measures, energy-savings tips and behavioral actions, as well as educational materials on recommended measures.

The Company subsidizes the audit cost, provides direct installation measures, and offers a multi-tiered, performance-based incentive for customers who install recommended measures. The rebate application process is simple and accessible electronically. The Company partners with Kentucky Housing Corporation to offer low-cost financing and maintain a broad network of BPI-certified contractors to support the program.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. The research question is listed below with a summary of our findings.

1. What can be done to improve conversion rates?

The Company has conducted minimal marketing for the performance incentive component of this program for the last year to allow time for implementation of the infrastructure needed to support it. As the Company begins to ramp up the marketing, as planned, customer awareness of installation incentives will increase and the conversion rates will likely follow suit.

The Company's performance-based incentive is modeled largely after the Home Performance with ENERGY STAR (HPwES) model, which has suffered from slow ramp-up and low conversion rates all

over the country for many years. Many factors—such as the size, number of occupants, and the baseline conditions in a home—can influence the cost to implement upgrades totaling 10% to 20% energy savings. In some cases such upgrades can cost many thousands of dollars, making them out of reach for many customers. Cadmus’ evaluations of similar programs have found significant economic barriers to these types of upgrades, particularly in less affluent areas and during the economic recession of the past several years. Thus, simply increasing marketing may not significantly increase conversion rates.

To promote a larger percentage of customers converting to installed measures, some similar programs in other jurisdictions often offer a weatherization track to supplement the performance-based incentive structure. This program option is an alternative for customers whose homes would benefit from cost-effective insulation and air sealing measures but who are not able to afford a comprehensive home energy upgrade that may include multiple expensive efficiency measures.

Cadmus’ potential study found that, depending upon existing conditions in the home, many insulation and infiltration reduction measures are likely to be cost-effective and could offer medium to high energy savings. These include wall insulation, floor insulation, and duct sealing and insulation. Currently, the Company offers these measures only through its low-income WeCare program. Thus, the Company may have an opportunity to expand the Home Energy Analysis program with a weatherization track, which can offer several potential benefits, including:

- Generating cost-effective energy savings that will contribute to the Home Energy Analysis program’s cost-effectiveness.
- Increasing customers’ access to and adoption of energy-efficiency upgrades in their homes.
- Increasing customers’ awareness of the benefits of energy efficiency and providing an entry point for longer-term involvement in the Company’s programs.
- Enhancing the Company’s relationship with its customers, which can be leveraged to promote additional program and energy-savings opportunities.
- Encouraging weatherization contractors to promote the program to customers who may need financial help to install insulation and infiltration upgrades.
- Increasing program conversion rates.
- Providing customers, who may be interested only in weatherization, with comprehensive recommendations on priority efficiency upgrades from a qualified professional to ensure their efficiency investment is worthwhile.

Conclusions

The Company has continued to make improvements to the Home Energy Analysis program over the last several years to ensure it meets customer needs while remaining cost-effective. Home energy audits alone do not generate energy savings, but by offering direct installation measures, the Company has created a cost-effective program that offers significant value to its customers. By adding performance-



based incentives last year, the Company has increased the program's potential to achieve even greater savings when customers install recommended measures.

However, participation in the new incentive component has remained low, in part due to minimal marketing during the program's first year as well as the potentially high cost of installing comprehensive efficiency upgrade projects necessary to meet the program's performance improvement requirement.

To increase program savings and address low conversion rates, similar programs offered in other jurisdictions include an incentive track that provides customers with rebates when they install weatherization measures. Adding this sort of track could increase both conversion rates and participation in the program.

Outcomes

In light of the potential study findings, and programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Home Energy Analysis program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Increase outreach focus on performance-based rebate component of the program to increase conversion rates.
- Implement an incentive track focused on weatherization measures. We recommend features of this track in the following subsection.
- Continue to monitor program participation, growth, and satisfaction closely and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Program Design Strategy

Based on its experience designing and evaluating home energy assessment and incentive programs, Cadmus offers the following program design recommendations for consideration in implementing an incentive program component.

- Require an onsite energy audit as a prerequisite to receiving any incentives through the Home Energy Analysis program. The diagnostic testing and visual inspection conducted during an onsite energy audit are critical to ensuring a high quality weatherization installation.
- Continue to provide cost-effective direct installation measures, as appropriate, in every audit.
- Consider offering incentives for installation of insulation, infiltration reduction, duct sealing, and insulation measures.
 - Structure incentives as a percentage of installed cost with a cap to simplify the application, incentive calculation, and verification processes.
 - Ensure the total incentives available for a typical installation are lower than those provided by the performance-based incentive tier in order to emphasize the whole-house approach.
 - Consider offering a bonus incentive to encourage customers to install multiple measures.

- Allow customers to select and hire any qualified contractor to perform installation services.
- Use a mail-in rebate application process or allow customers to assign the incentive to their installation contractor so that the incentive can be deducted from the customers' invoice.
- Conduct outreach and education to insulation contractors to inform them of the new program component and its quality assurance protocols and to encourage them to promote the program to their customers.
- Use a sample-based verification and quality assurance approach to reduce implementation costs. Design a custom sample for active program installation contractors, whereby the sample sized is reduced over time as contractors establish a track record with the program (e.g., 20% of jobs verified first year, decreasing to 5% as contractors establish their credibility).

Smart Energy Profile

Program Description

The Smart Energy Profile program, launched in 2012, uses the Opower® model to deliver customized home energy reports to customers periodically throughout the year. Reports target customers with the highest energy use within the territory. Each report includes two comparisons, the home's energy usage to other homes within the same customer demographic segmentation group⁵ and the home's current and historical usage. The report also suggests energy-savings improvements and actions.

The Smart Energy Profile program also offers an online component and conducts e-mail outreach that focuses on educational messaging; these do not generate savings for the program. Some customers receive mini reports through e-mail, as an alternative or supplement to paper reports they receive through the mail.

The Company claims energy savings from actions taken by customers that result from the paper home energy reports received in the mail.

Best Practices Gap Analysis Results

Cadmus compared the Smart Energy Profile program to a range of industry best practices common for behavior-based energy education programs. Table 18 presents the results of this analysis.

⁵ These customer segmentation groups are developed and maintained by Opower to be used for energy use comparison reports only, and is not owned or managed by the Company.



Table 18. Behavior-Based Energy Education Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Measures and Incentives		
Provide information on and linkages to available incentives through other utility programs.	Yes	Paper reports provide recommendations for both behavioral and equipment upgrades. Where applicable, recommendations link equipment upgrade to the Company program incentives.
Marketing and Education		
Conduct market research to understand the motivations and barriers to participate in efficient behaviors. Use messaging that communicates the benefits of taking action while minimizing the barriers to action.	Yes	Reports include customized suggestions of behavior changes and home improvements customers can make to reduce their energy use. Benefits are communicated through estimated cost savings potential as result of making the improvements.
Use consistent branding and messaging to establish brand recognition.	Yes	Consistent branding is used.
Make marketing materials and other program information multi-lingual	No	Marketing materials and program information are in English.
Program Delivery and Implementation		
Use targeted research on demographic and lifestyle variables that influence energy use.	Partial	The segmentation strategy is based on demographics and physical dwelling attributes as well as energy usage. Lifestyle variables are not considered.
Support written communications with user-friendly, well-designed website.	Yes	A link to the website is included in the report mailed to customers.
Tracking and QC		
If attributing energy savings to the program, use an experimental research design method to calculate savings.	Yes	A control group is used for comparison to determine actual program savings. The program does not use deemed savings

The Smart Energy Profile program is designed using many industry-established best practices for behavior change programs. For example, the reports sent to customers provide usage information and a comparison to similar homes, information and suggestions on actions customers can take to reduce their usage, and links from equipment upgrade recommendations to available programs and incentives offered by the Company.

The program branding and messaging has stayed consistent to improve customer brand recognition, and the mailed communications are well supported by a user-friendly, well-designed website and e-mail communications, all of which are vital to a successful program.

Research Results

Cadmus conducted research to address specific questions dictated by the Company staff. The research question is listed below with a summary of our findings.

1. Although this program is on target for demand savings, the energy savings are lower than anticipated. Can anything be done to improve energy savings?

Cadmus conducted a benchmarking review to compare the Company's program results with those of other program sponsors. We found that it is not unusual for savings in behavioral programs to achieve lower than 2% savings the first few years. However, because these programs are relatively new, we were able to find only a small number of utilities with more than one year of savings history. Table 19 provides the results of our benchmarking analysis.

Table 19. Comparison of Behavioral Program Savings, first 3 years*

Program	Year 1 Savings	Year 2 Savings	Year 3 Savings
Puget Sound Energy's Home Energy Reports Program	1.71% electric 1.17% gas	2% electric 1.46% gas	N/A
Massachusetts NSTAR Home Energy Report (HER)	1.61% electric 0.81% gas	1.25% electric 1.21% gas	1.37% electric 0.99% gas
Western Mass Saves (WMS)	0.36% electric	N/A	N/A
Energy Center of Wisconsin PowerCost Monitoring Program	1.4% electric	N/A	N/A
Sacramento Municipal Utility District (SMUD)	2.2% electric	2.89% high consumption households 1.70% low consumption households	N/A
Energy Solutions Rewards	0.24% electric	N/A	N/A

* Savings provided are for passive participants only, which equates to the Company's Smart Energy Profile program.

Although the program savings are lower than anticipated, the Smart Energy Profile program is well-designed, using a proven approach and relying on numerous best practices (see Table 18 above). The Company uses an opt-out strategy, in which a sample of customers automatically receives reports and must take action to stop participating. This model typically produces greater savings than an opt-in model, which requires customer action to participate. Customer feedback has been mostly positive so far, and the dropout rate of 0.5% is significantly lower than the Opower average of 1% to 2%.

The Company has taken proactive efforts to boost participation by increasing both the number of customers receiving reports and the distribution frequency. As a result, the Company exceeded its outreach targets by 50% in the second year. Because the program is still very new, it may be too soon to make significant additional adjustments until the program has more time to mature.

Conclusions

The Smart Energy Profile program has been running less than two years and, although the program has not achieved its anticipated energy savings goal, it has met its demand savings target. The program's dropout rate is much lower than is typical for this type of program. It is not unusual for behavior change programs to ramp up gradually over the first two to three years of implementation, and therefore these results are consistent with Cadmus' observations in other jurisdictions. Furthermore, the program implements several best practices and generates positive feedback from participating customers.

We anticipate the combination of organic market adoption increases and the corrective actions the Company has taken to boost program savings will likely deliver increased savings results during the next few program years.

Outcomes

In light of programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Smart Energy Profile program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Continue to offer the program and monitor results through the end of the current program funding cycle.

Residential Demand Conservation

Program Description

The Company launched its Residential Demand Conservation program in 2001. Program participants receive an incentive when they agree to have one-way radio load control switches installed on their eligible appliances and permit the Company to cycle off their appliances during the summer peak season to reduce overall demand.

The Company schedules cycling events, between June and September when demand peaks are expected, based on forecast, humidity, heat, or a system emergency. Events are usually four hours, often between 2:00 p.m. and 6:00 p.m., when customer demand is highest. During the four-hour events, the Company shuts off a participants' equipment for half its normal cycle, on 15-minute intervals. Events are limited to 20 days total per year, but they often average 10 to 11 days per year.

The Company provides incentives by crediting the customers' utility bill for each participating appliance during each eligible program month of participation. Starting in 2012, to boost enrollment, the Company periodically offers customers a bonus to new participants for signing up. Eligible equipment and incentives, offered to single-family homeowners, are shown in Table 20.

Table 20. Residential Demand Conservation Incentive Levels

Eligible Appliance	Monthly Bill Credit
Central Air Conditioner	\$5
Heat Pump	\$5

Water Heater	\$2
Pool Pump	\$2
New Participant Bonus	\$20

The Company markets the program through a variety of channels including brochures, newspapers and magazines, television, radio, direct mail, bill inserts, phone calls, web-based advertising, and social media. The Company also cross-promotes the program with the WeCare and Home Energy Rebates programs. Quality control checks are conducted on a random 10% of switches each year in order to replace switches that are disconnected or dysfunctional and also to monitor the state of the entire system.

Although the Company has faced a few challenges from the lack of customer awareness and confusion about the program's benefits, these have largely been addressed through education and outreach. Throughout its history, the Residential Demand Conservation program has been cost-effective and extremely successful, with saturation currently at 22% of all customers and 27% of all customers who use controllable technology and a drop-out rate of only about 1%.

Best Practices Gap Analysis Results

Cadmus compared the Residential Demand Conservation program to the industry best practices common for residential load control programs. Table 21 presents the results of this analysis.

Table 21. Residential Demand Load Control Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Allow program eligibility for all equipment and systems (i.e., CAC, water heaters, pool pumps, etc.) that are viable in the territory.	Yes	Central air conditioners, heat pumps, water heaters, and pool pumps are all eligible for the program.
Develop a load management plan that specifies number of days, hours devices are controlled, cycling time/percent, season and days of the week, etc., that works for both customers and the utility	Yes	The Company has developed a plan that is working well for their customers and the demand reduction goals of the program.
Work with system operators to understand the needs for peak load savings and reliability.	Yes	The Company's program is matched to their system needs, as demonstrated by the many successful year the program has been running.
Measures and Incentives		
Offer a large enough incentive to gain customers' interest; continue to provide an incentive each year the customer participates.	Yes	Incentives are offered each year a customer participates and saturation rates are among the highest when compared to similar programs.
Marketing and Education		



Best Practice Elements and Innovations	The Company	Details
Marketing materials should clearly outline the program, why it is necessary, and what the alternatives are (higher rates, building more power plants, etc.).	Yes	The Company provides this information to their customers through marketing materials, as well as program specific brochures and courtesy calls to customers.
To each new participant, provide educational materials that offer tips for managing peak demand voluntarily (e.g., doing laundry at night). Also use this opportunity to provide materials on other energy-efficiency programs.	No	This information is not provided to customers at this time.
Provide program marketing materials to customers who apply for new central air conditioner rebates.	No	Although the Company cross-promotes with other programs, they do not specifically promote the program to customers applying for central air conditioner rebates.
Program Delivery and Implementation		
Conduct customer satisfaction surveys to gather information on program barriers and bottlenecks and solicit feedback from customers.	Yes	The Company conducts customer surveys to collect this information on a variety of programs.
Provide annual feedback to customers on the system-wide program benefits and thank them for making a difference.	No	This is not done at this time.
Tracking and QC		
Adopt a regular schedule to test appliance cycling switches in the service territory and replace any that are missing or not functioning.	Partial	QC is done on a random sample each year with 10% of program participant switches. Those that are faulty are replaced; however, there is no systematic procedure to replace older switches reaching the end of their usable life.
Choose high quality hardware and communications systems that can grow with the utility's needs.	Yes	The Company is continuing to research two-way communications as possible option in the future.

The Company designed the Residential Demand Conservation program using many industry-established best practices for residential demand control programs. For example, it offers incentives for multiple controllable technologies, including central air conditioners, heat pumps, water heater, and pool pumps. The Company has developed a plan that specifies number of days, number of hours devices are controlled, cycling time of day, and season that works for its customers and meets the system needs for peak load savings and reliability. The Company provides program information to customers through a variety of channels, including outreach to new homeowners and tenants, and collect customers' feedback on a regular basis.



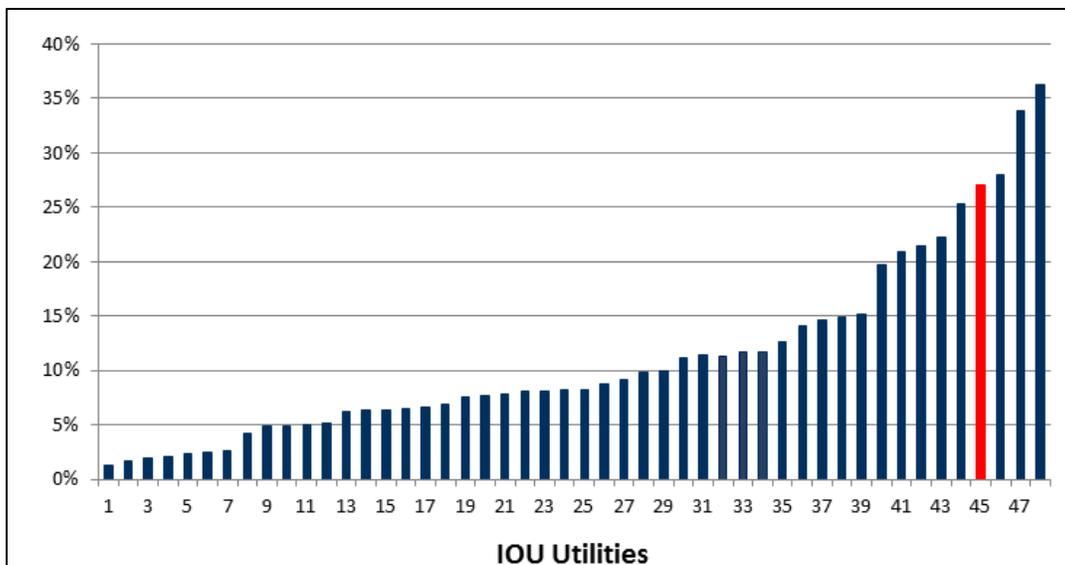
Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. The research question is listed below with a summary of our findings.

1. Although the program is successful, are there ways to achieve more savings?

Cadmus conducted a benchmarking study to compare the Residential Demand Conservation program’s saturation, incentives, and program structure to residential demand control programs in other jurisdictions. The Company’s Residential Demand Conservation program has achieved among the highest saturations of customers with controllable technology, as shown in Figure 4. (Saturation level for the Company is shown in red.)

Figure 4. Residential Saturation by Customer Participation



Cadmus also compared the Residential Demand Conservation program’s incentive levels and program parameters to similar programs in other jurisdictions and found its features and incentives to be consistent with most programs. Our findings are presented in Table 22.



Table 22. Residential Demand Control Program Incentives

Utility	Curtailement Season	Air Conditioner Incentive (Full Season)	Eligible Appliances
The Company	June-September	\$20 (\$5 per month/4 months)	Air Conditioner Heat Pump Hot Water Heater Pool Pump
Interstate Power and Light	May-September	\$40 (\$8 per month/5 months)	Air Conditioner Hot Water heater
Entergy Arkansas Inc.	June-September	50% cycling - \$25 75% cycling - \$40	Air Conditioner Heat Pump
PPL Electric Utilities	June-September	\$32	Air Conditioner Heat Pump
Xcel Energy	June-September	\$40	Air Conditioner
San Diego Gas and Electric	May – October	50% cycling - \$15 per ton 30% cycling - \$9 per ton	Air Conditioner

We note that the Company offers among the lowest incentive of the similar programs we reviewed, but not significantly so. Given the Company's high program saturation, increasing savings further may prove challenging.

Conclusions

Using many industry best practices, the Company's Residential Demand Conservation program has been very successful and achieved a saturation level well above average when compared to peer utility programs. The program has always been cost-effective and achieved the Company's targets.

The program offers incentives to customers within the normal range. Though the program has already achieved very high saturation, there may be an opportunity to experiment with higher incentive levels or adopt a multi-tiered structure in an effort to increase participation rates, if the Company so desired.

Outcomes

In light of programmatic strategy discussions, Cadmus determined that the following action would further enhance the Residential Demand Conservation program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Continue to monitor program participation, growth, and satisfaction closely, and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Fridge and Freezer Recycling

Program Description

The Company's Fridge and Freezer Recycling program, launched in the spring of 2012, offers residential customers an incentive to have secondary, operational freezers and refrigerators picked up and recycled. In the first year, the program did not reach targets, but after increasing the incentive from \$30 to \$50 and implementing an improved marketing campaign, the program has been more successful this year and is on track to meet goals.

The program is available to all residential customers. Eligible appliances must be operational and a standard size (7.75 cubic feet and larger); customer eligibility is limited to two units per year.

ARCA, an experienced third-party appliance recycling implementation contractor, provides turn-key services to deliver the Fridge and Freezer Recycling program. These services are marketing to retailers, scheduling and conducting pickups, recycling appliances in an environmentally responsible manner, tracking, and administration. The Company markets the program through a variety of channels, including brochures, bill insert, television, newspaper, radio, direct mail, billboards, web advertising, vendor vehicles wraps, and some limited social media.

The Company reaches out to retailers and provides point of sale (POS) materials to encourage customers who might be shopping for a new freezer or refrigerator to consider recycling their old one. While some retailers participate, others who sell replaced units on the secondary market have shown less interest.

Many community action groups (CAGs) that work with low-income customers have also started to participate. In these cases, the customer allocates the incentive to the CAG, which in turn, schedules the pickup with the program vendor.

Best Practices Gap Analysis Results

Cadmus compared the Fridge and Freezer Recycling program to the industry best practices common for appliance recycling programs. Table 23 presents the results of this analysis.

Table 23. Appliance Recycling Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Use an experienced third-party vendor with regional infrastructure to provide program services.	Yes	The Company works with ARCA, an experienced vendor, to implement the program.
Coordinate with other regional utilities to leverage a single program implementation contractor.	N/A	No other utilities in the state offer similar programs.
Measures and Incentives		



Best Practice Elements and Innovations	The Company	Details
Provide incentives at the time appliances are picked up.	No	Incentives are mailed to customers following pickup.
If similar programs are offered by other regional utilities, coordinate to provide consistent incentives to avoid customer confusion.	N/A	No other utilities in the state offer similar programs.
Marketing and Education		
Promote the recycling program to customers who have received a rebate on a new appliance.	Yes	Customers who apply for a freezer or refrigerator rebate through another The Company program receive information on recycling the old unit.
Partner the recycling program message with state or federal appliance rebate programs (if applicable).	N/A	No other utilities in the state offer similar programs.
Work with local retailers to promote the program to customers purchasing a new appliance.	Yes	POS materials are provided to retailers to share with customers buying new appliances.
Marketing message identifies specific customer benefits of disposing of the second appliance.	Partial	Benefits described on website include reducing energy waste, incentive, and professional pickup. Messaging does not specifically call out pickup, environmental benefits of recycling, or removal of toxic materials from the waste stream.
Program Delivery and Implementation		
Allow customers to enroll in the program and schedule pickup at retail locations when purchasing a new appliance.	No	Customers must sign up online or call customer service to sign up for the program.
Use a simple signup process (e.g., online scheduling) and offer pickup on Saturday.	Partial	Online scheduling is not available at this time. Pickup on Saturday is available.
Pick up units within one week of receipt of a request for pickup.	Yes	ARCA picks up appliances within a week of the initial request.
Tracking and QC		
Conduct random inspections of recycling services contractor to ensure program compliance.	No	The Company does not conduct inspections of recycling service contractors or facilities at this time.

The Company designed the Fridge and Freezer Recycling program using many industry best practices. For example, the Company partners with ARCA, an experienced appliance recycling vendor, and works with retailers to promote the program to customers buying new appliances. The Company also provides program materials to customers when they apply for a rebate for a new refrigerator or freezer to encourage them to recycle their old unit. ARCA picks up units within one week of a customer's request.

Research Results

Cadmus conducted additional research to address specific questions dictated by Company staff. The research question is listed below with a summary of our findings.

1. Are there other best practices or program enhancements that should be considered?

Utility-sponsored appliance recycling programs, including the Company's Fridge and Freezer Recycling program, typically follow a prescribed model that has been honed over several years by two experienced program vendors (ARCA and JACO). This model is efficient and effective, relies on a proven marketing strategy, and engenders universally high customer satisfaction rates. The Company's program is consistent with similar programs; common program components include:

- Pickup of standard freezer or refrigerator
- Rebate amount range is \$35 to \$50
- Unit must be operational at pickup
- Up to two units permitted a year

A few programs in other jurisdictions also offer an incentive to pick up room air conditioners along with a refrigerator or a freezer. Because a room air conditioner pickup is not cost-effective on its own, other programs typically pair the room air conditioner with a larger appliance pickup.

Some utilities also sponsor periodic room air conditioner drop-off events, during which customers can bring room air conditioners to a designated location, such as a big box store parking lot, and drop it off in exchange for a small incentive. The incentive for a room air conditioner is often about half that of a larger appliance.

Conclusions

The Company's Fridge and Freezer Recycling program follows many industry best practices, and it is on track to hit targets this year. By using an experienced vendor, working with retailers, and offering an incentive high enough to engage customers, the program is expected to remain successful for the foreseeable future. The Company also encourages CAGs to recycle old units that are removed from WeCare program participant homes and this helps to stretch low-income program funds.

Outcome

In light of programmatic strategy discussions, Cadmus determined that the following actions would further enhance the Fridge and Freezer Recycling program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Continue to monitor program participation, growth, and satisfaction closely and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.



WeCare

Program Description

Originally launched as a pilot in 1994, the WeCare program has gone through several modifications as it has evolved to better serve the needs of the Company's low-income customers. For the last several years, the program has been relative close to achieving its goals.

At present, the program is designed to reduce energy use for program-eligible customers whose income is at or below 150% of the federal poverty level. The program provides energy audits, direct install measures, energy savings behavior education, weatherization, and other energy savings measures based on the unique needs of each home. Investment in each house depends on its energy usage.

The Company also bases participation goals on usage, with a higher participation target for higher energy use homes and a lower target for lower use homes.

A third-party implementer, as well as a CAG implements the program, combining the Company program funds with federal Low-Income Heating Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP) funds to provide each participant with a comprehensive, energy audit and direct installed measures during the first visit. The implementer and CAG also provide customers educational materials and assistance in filling out program paperwork if they choose to have recommended measures installed. CAGs and contractors conduct program outreach to customers in need of energy assistance and provide referrals to other human services programs where appropriate.

Best Practices Gap Analysis Results

Cadmus compared the WeCare program to industry best practices common for low-income weatherization programs. Table 24 presents the results of this analysis.

Table 24. Low-Income Weatherization Program Best Practices

Best Practice Elements and Innovations	The Company	Details
Program Management		
Integrate program resources with federal low-income funding: Weatherization assistance program (WAP) and Low-Income Home Energy Assistance Program (LIHEAP).	Yes	CAC Lexington, one of the implementers, uses some federal low-income funding along with the Company funding to serve low-income customers.
Work with implementing agencies that have strong ties to low-income communities.	Yes	The Company works with CAC Lexington to implement the program.
Consider local economic indicators in setting eligibility levels.	Partial	The Company uses federal guidelines to set program eligibility.

Best Practice Elements and Innovations	The Company	Details
Measures and Incentives		
Offer direct installation measures.	Yes	Direct install measures are offered as part of the audit.
Enable installation of all cost-effective measures through a combination of utility and public sector funding sources.	Yes	Program providers install all recommended measures up to a cap.
Marketing and Education		
Leverage existing human and social services providers for outreach.	Yes	CAGs promote the program to customers who would benefit from the services.
Work with credit counseling agencies to integrate energy-efficiency education and promote program participation.	No	This is not done at this time.
Include energy education with customers that highlights low cost and behavioral energy savings strategies.	Yes	The Company provides energy savings behavior education to customers as part of the audit visit.
Program Delivery and Implementation		
Use a fuel blind approach.	Yes	The program implementers install both electric and gas measures based on the need of the home
Work with existing customer channels for delivery (e.g., community action groups).	Yes	CAG agencies inform customers of the program, and CAC Lexington helps implement the program.
Create participation pathways for low-income multifamily housing and customers in rental housing.	Yes	The program is made available to customers in rental housing and multifamily housing.
Tracking and QC		
Ensure audit and installation staff are trained in whole-house building science techniques.	Yes	The program implementer staff are trained in whole-house building science techniques.
Use a simple, automated data tracking system	Yes	The Company uses an automated data tracking system.

The Company designed the WeCare program using many industry-established best practices for low-income weatherization programs. For example, CAC Lexington helps implement the program, and other CAGs help inform low-income customers of the opportunities available through WeCare. The program offers services to income-qualified customers; these services include an audit, direct installs, educational materials on energy saving behaviors, as well as installation of more costly energy saving measures such as insulation, air sealing, duct sealing, and appliance replacements.

Research Results

Cadmus conducted additional research to address specific questions dictated by the Company staff. The research question is listed below with a summary of our findings.



1. How should participation be encouraged in the future, without the program being overrun?

Achieving program targets requires careful monitoring to ensure the program strikes a balance between participation and spending. Utilities frequently work with multiple CAGs to provide low-income implementation support across a regional territory. CAC Lexington serves as one of the Company's primary program implementers and several other CAGs provide additional support by promoting the program to eligible customers.

Historically the Company has been able to leverage its partnership with CAC Lexington to fulfill its program goals and ensure appropriate levels of participation each year. As the program grows and the Company allocates additional funding to its low-income efficiency efforts, it may require additional support to meet full program capacity. Allowing other CAGs to participate as additional program service providers in the future, as the Company already has plans to do, will not only broaden the program's reach and strengthen those partnerships, but can also help the Company increase its participation rates as the program grows.

The Company will need to continue to monitor program spending and assess each implementer's delivery capacity to efficiently meet program needs and spending targets.

Additionally, some utilities leverage internal customer data to identify and reach out directly to customers who may face challenges meeting their monthly costs—for example, targeting those who have received shut-off notices—to increase participation in a controlled manner.

Conclusions

The Company has been offering a low-income weatherization program, now known as WeCare, to customers since the mid-1990s. The program effectively provides needed energy-efficiency improvements and behavioral education to low-income households in the Company's service territory. The program design relies on many industry-established best practices, including working with CAC Lexington to implement the program, and many other CAGs to promote the program.

As the program grows and the Company allocates additional funding, the single CAG that currently provides program implementation may reach its functional service capacity. The Company has plans to build partnerships with additional CAGs and incorporate them into the program as needed to meet demand and enhance delivery to a broad base of low-income customers.

Outcomes

In light of programmatic strategy discussions, Cadmus determined that the following actions would further enhance the WeCare program. The Company is reviewing these strategies for inclusion in its 2015-2018 program cycle.

- Recruit new CAGs to support program implementation as needed to meet participation targets and funding obligations.

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- Continue to monitor program participation, growth, and satisfaction closely, and implement other best practices as necessary to ensure the program continues to meet the Company's objectives.

Appendix A

Table 25. Residential Measure Gap Analysis

Program	Measure Group	Measures	Potential							
			Technical		Achievable		Rank (Energy)		Rank (Demand)	
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable
Home Energy Rebates	HVAC	Split System Air Conditioner > SEER 14.5	186,323,717	24,617	0	0	High	-	High	-
			0	0	0	0	-	-	-	-
		Single Package Air Conditioner > SEER 14	0	0	0	0	-	-	-	-
		Split System ASHP > SEER 14.5	78,664,017	10,373	0	0	Med	-	High	-
			0	0	0	0	-	-	-	-
		Single Package ASHP > SEER 14	0	0	0	0	-	-	-	-
		0	0	0	0	-	-	-	-	
	Weatherization	Window Film solar heat gain coefficient < 0.45	37,812,744	5,024	0	0	Med	-	Med	-
		Window Film with shading coefficient < 0.50			0					
	Water Heaters and Devices	ES Heat Pump Water Heater	197,890,105	13,296	0	0	High	-	High	-
			138,158,879	9,246	0	0	High	-	High	-
	Appliances	ES Clothes Washer	9,747,886	659	0	0	Low	-	Low	-
			0	0	0	0	-	-	-	-
			0	0	0	0	-	-	-	-
		ES Dishwasher	0	0	0	0	-	-	-	-
			3,261,919	226	0	0	Low	-	Low	-
		ES Freezer	0	0	0	0	-	-	-	-
		ES Refrigerator ≥ 7.75 cu.ft.	74,474,163	9,074	0	0	Med	-	Med	-
			0	0	0	0	-	-	-	-
	0		0	10,292,182	1,254	-	Med	-	Med	
High-Efficiency Lighting	Lighting	CFL Bulbs	0	0	0	-	-	-	-	
		7,761,624	311	55,434,608	2,218	Low	High	Low	Med	

Program	Measure Group	Measures	Potential								
			Technical		Achievable		Rank (Energy)		Rank (Demand)		
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable	
Home Energy Analysis	Lighting	Online Home Energy Analysis CFL Bulbs (6)			0						
		Onsite Home Energy Analysis CFL Bulbs (6)			0						
	Audits	Faucet Aerator (0-2)		0	0	10,561,649	709	-	Med	-	Low
				40,741,212	2,742	37,488,052	2,515	Med	Med	Med	Med
		Low-Flow Showerhead (0-2)		55,793,487	3,778	50,520,123	3,405	Low	Low	Low	Low
				0	0	0	0	Low	Low	Low	Low
			Smart Strip	6,263,769	631	0	0	Low	-	Low	-
Duct Sealing	87,016,682	8,659	20,829,294	2,786	High	Med	Med	Med			
Air Sealing	23,576,398	1,906	0	0	Low	-	Low	-			
Fridge and Freezer Recycling	Appliance Recycling	ES Freezer	56,813,748	7,947	28,406,865	3,973	Med	Med	Med	Med	
		ES Refrigerator ≥ 7.75 cu.ft.	111,573,866	13,595	61,973,542	7,551	High	High	High	Med	
AC Testing and Tune-up	HVAC	AC Test	73,137,013	9,679	0	0	Med	-	High	-	
		AC Tune-up			0						
		Heat Pump Testing	7,735,397	1,025	0	0	Low	-	-	-	
		Heat Pump Tune-up	-	-	0	-	-	-	-	-	
WeCare	HVAC	EE Air Conditioner (Replacement)	340,742	44	0	0	Low	-	Low	-	
		AC Tune-up	73,137,013	9,679	0	0	Med	-	High	-	
		Heating System Tune-up	82,036,897	4	26,709,805	0	Med	Med	Low	Low	
		Programmable Thermostat	104,219,456	9,684	70,289,671	6,874	High	High	Med	Med	
	Weatherization	Air Sealing	23,576,398	1,906	0	0	Low	-	Low	-	
		Duct Sealing	87,016,682	8,659	20,829,294	2,786	High	Med	Med	Med	
		Duct Insulation	-	-	0	-	-	-	-	-	
		Attic Insulation	132,374,865	10,235	0	0	High	-	Med	-	
EE Window (replacements)		0	0	0	0	-	-	-	-		
		339,279,979	25,759	0	0	High	-	Med	-		



Program	Measure Group	Measures	Potential							
			Technical		Achievable		Rank (Energy)		Rank (Demand)	
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable
		Floor Insulation	52,190,476	2,530	12,647,941	1,677	Med	Med	Med	Med
		Wall Insulation	14,651,097	924	6,142,971	363	Low	Low	Low	Low
			427,206,656	31,711	217,083,876	14,330	High	High	High	Med
	Water Heaters and Devices	Water Heater Insulation jacket	-	-	0	-	-	-	-	-
		Faucet Aerator	0	0	10,561,649	709	-	Med	-	Low
			40,741,212	2,742	37,488,052	2,515	Med	Med	Med	Med
		Low-Flow Showerhead	55,793,487	3,778	50,520,123	3,405	Low	Low	Low	Low
	0		0	0	0	Low	Low	Low	Low	
	Appliances	EE Refrigerator (Replacements)	74,474,163	9,074	0	0	Med	-	Med	-
			0	0	0	0	-	-	-	-
			0	0	10,292,182	1,254	-	Med	-	Med
	Lighting	Onsite Home Energy Analysis CFL Bulbs (6)	0	0	0	-	-	-	-	-
			7,761,624	311	55,434,608	2,218	Low	High	Low	Med
Measures not currently offered	Whole-House Fan	116,894,545	15,602	60,681,397	8,116	High	Med	High	Med	
	Door (KY) - Above Code	57,126,296	4,174	54,168,495	3,770	Med	Med	Med	Med	
	Quality Installation - Heat Pump	112,200,338	14,867	58,320,608	7,732	High	Med	High	Med	
	Quality Installation - Central Air Conditioner	95,625,372	12,654	40,494,719	5,416	Med	Med	High	Med	
	Motor - ECM	125,794,900	3	34,624,413	0	High	Med	Low	Low	
	Set Top Box - ENERGY STAR	65,111,313	7,199	32,555,647	3,599	Med	Med	Med	Med	
	Door (KY) - Above Code	57,126,296	4,174	54,168,495	3,770	Med	Med	Med	Med	
	Insulation - Basement Wall	12,602,019	691	8,090,519	484	Low	Low	Low	Low	
	Wi-Fi Thermostat	12,282,184	1,059	2,960,185	396	Low	Low	Low	Low	

Table 26. Commercial Measure Gap Analysis

Program	Measure Group	Measures	Potential								
			Technical		Achievable		Potential Rank (kWh)		Potential Rank (kW)		
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable	
AC Testing and Tune-up	HVAC	AC Test	25,529,162	13,581	0	0	Med	-	High	-	
		AC Tune-up									
		Heat Pump Testing	7,799,646	4,141	0	0	Low	-	Med	-	
		Heat Pump Tune-up									
Commercial Energy Rebates	AC Units	PTAC	15,745	7	0	0	Low	-	Low	-	
		PTHP	249,897	113	0	0	Low	-	Low	-	
		Unitary AC	160,328	91	95,895	55	Low	Low	Low	Low	
		Unitary HP	0	0	0	0	-	-	-	-	
			1,103,840	599	169	0	Low	Low	Low	-	
			0	0	0	0	-	-	-	-	
			215,739	124	35	0	Low	Low	Low	-	
			0	0	0	0	-	-	-	-	
			1,645,967	846	277	0	Low	Low	Low	-	
			0	0	0	0	-	-	-	-	
		Rooftop AC	657,223	348	436,782	239	Low	Low	Low	Low	
			0	0	0	0	-	-	-	-	
			2,846,627	1,543	538,936	292	Low	Low	Med	Low	
			0	0	0	0	-	-	-	-	
			1,648,304	846	515,451	296	Low	Low	Low	Low	
			0	0	0	0	-	-	-	-	
		GSHP	986,075	535	0	0	Low	-	Low	-	
			196,764	113	0	0	Low	-	Low	-	
			1,113,908	577	0	0	Low	-	Low	-	
		Chillers	Air Cooled or Water Cooled	1,962,753	918	0	0	Low	-	Low	-
				0	0	0	0	-	-	-	-
				0	0	0	0	-	-	-	-



Program	Measure Group	Measures	Potential								
			Technical		Achievable		Potential Rank (kWh)		Potential Rank (kW)		
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable	
			0	0	0	0	-	-	-	-	
			22,890	12	153,835	83	Low	Low	Low	Low	
			1,024,640	556	138,033	75	Low	-	Low	-	
			1,790,398	723	701,440	219	Low	Low	Low	Low	
			0	0	1,856	2	-	-	-	-	
			0	0	427	0	-	-	-	-	
		Chilled Water Reset	1,438,246	677	0	0	Low	-	Low	-	
	Refrigeration	Commercial	11,121,132	1,599	6,848,381	985	Med	Low	Med	Med	
13,956,366			2,028	8,576,727	1,246	Med	Low	Med	Med		
15,108,129			2,195	9,303,583	1,352	Med	Low	Med	Med		
1,117,571			162	0	0	Low	-	Low	-		
14,561,094			2,111	0	0	Med	-	Med	-		
19,769,720			2,867	0	0	Med	-	Med	-		
9,476,594			1,415	1,175,746	199	Low	Low	Med	Low		
5,619,635			839	0	0	Low	-	Low	-		
1,276,379			186	785,991	115	Low	Low	Low	Low		
4,466,708			654	2,742,944	402	Low	Low	Low	Low		
2,127,907			300	0	0	Low	-	Low	-		
4,827,232			680	2,972,608	419	Low	Low	Low	Low		
16,426,774			2,376	0	0	Med	-	Med	-		
1,673,298			236	1,030,274	145	Low	Low	Low	Low		
1,756,193			254	0	0	Low	-	Low	-		
2,319,150			332	0	0	Low	-	Low	-		
567,600			118	270,477	66	Low	Low	Low	Low		
			Residential		4,645,550	705	0	0	Low	-	Low
				0	0	0	0	-	-	-	-

Program	Measure Group	Measures	Potential							
			Technical		Achievable		Potential Rank (kWh)		Potential Rank (kW)	
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable
			0	0	880,211	134	-	Low	-	Low
	Lighting	T5 with EB	88,823,666	14,975	0	0	High	-	High	-
		T8 with EB	0	0	0	0	-	-	-	-
		HP T8	0	0	1,533,681	222	-	Low	-	Low
		RW HP T8	33,615,541	5,619	2,524,626	391	Med	Low	Med	Low
		Metal Halide	0	0	0	0	Low	-	-	-
		High Bay Fluorescent HO	29,741,421	5,090	0	0	Med	-	Med	-
		High Bay LED	1,508,150	258	0	0	Low	-	Low	-
		CFLs	0	0	0	0	Low	-	-	-
		LEDs	72,952,088	11,543	45,958,007	7,303	High	High	High	High
		High-Efficiency Lighting Package	43,778,349	7,120	1,601,902	180	Med	Low	Med	Low
		Exit Sign - LED	12,676,300	2,059	1,645,293	347	Med	-	Med	-
		Exterior Building Lighting	74,582,303	830	5,054,081	56	High	Low	Low	Low
	Motors and Pumps	VFDs	8,670,402	1,801	4,205,481	884	Low	Low	Med	Low
			7,904,147	3,885	3,385,564	1,817	Low	Low	Med	Med
			104,981,657	21,151	50,376,957	10,255	High	High	High	High
	Motors		8,894,136	1,822	4,236,110	878	Low	Low	Med	Low
	Motors and Pumps	Compressed Air Systems	21,315,104	3,123	13,125,837	1,923	Med	Med	Med	Med
	Lighting	Day Lighting Controls	80,274,501	894	12,420,641	138	High	Med	Low	Low
		Induction Lighting	0	0	1,476,542	254	-	Low	-	Low
	HVAC	Exhaust Ventilation	1,142,011	283	0	0	Low	-	Low	-
			2,228,443	979	137,375	74	Low	Low	Med	Low
	Weatherization	Insulation	12,176,813	3,713	933,932	524	Med	Low	Med	Low
			14,400,068	6,859	4,913,605	2,607	Med	Low	Med	Med
			12,294,230	3,921	2,213,421	1,022	Med	Low	Med	Low
			5,012,084	1,232	464,055	224	Low	Low	Med	Low



Program	Measure Group	Measures	Potential							
			Technical		Achievable		Potential Rank (kWh)		Potential Rank (kW)	
			kWh	kW	kWh	kW	Technical	Achievable	Technical	Achievable
Measures not currently offered		Convert Constant Volume Air System to VAV	43,975,392	14,312	0	0	Med	-	High	-
		Dimming-Continuous, Fluorescent Fixtures	46,310,591	9,510	0	0	Med	-	High	-
		Direct Digital Control System-Installation	74,922,392	35,881	41,660,467	21,939	High	High	High	High
		DX Package-Air Side Economizer	4,465,838	2,378	0	0	Low	-	Med	-
		Network PC Power Management	46,597,021	6,240	28,714,577	3,843	Med	High	Med	Med
		Occupancy Sensor Control	134,629,644	18,628	35,567,843	6,918	High	High	High	Med
		Re-Commissioning	101,334,158	48,593	31,341,536	16,396	High	High	High	High
		Parking - Covered Lighting	1,317,300	15	0	0	Low	-	Low	-
		Parking - Surface Lighting	52,740,002	587	0	0	High	-	Low	-
		Windows-High-efficiency	29,949,413	15,612	15,639,141	8,154	Med	Med	High	Med
		Low-Flow Faucet Aerators	3,544,069	581	3,342,340	549	Low	-	Low	-
		Low-Flow Showerheads	4,858,074	664	3,814,093	522	Low	Low	Low	Med
		Hotel Key Card Room Energy Control System	24,000,480	6,118	14,519,981	3,576	Med	Med	Med	Med
		Cool Roofs	49,965,975	26,889	13,108,419	7,106	Med	Med	High	Med
		Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	50,820,808	27,552	18,596,403	10,083	High	Med	High	Med
		Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	26,139,661	13,418	13,768,282	7,272	Med	Med	High	Med
	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	8,861,523	4,758	5,995,552	3,332	Low	Low	Med	Med	

CADMUS



In Collaboration with: EHI Consultants

Energy Efficiency Potential Study

December 2013

Louisville Gas and Electric Company and Kentucky Utilities Company
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Executive Summary

Overview

This report summarizes the results of an independent study of the long-run technical, economic, and achievable potential for electric and natural gas energy efficiency for the residential and commercial sectors in the service territories of Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU)—collectively referred to as “the Company”— from 2014 to 2033.¹ The Company commissioned this study to comply with the Kentucky Public Service Commission’s Order Case No. 2011-00375. While this analysis focuses primarily on electric efficiency, Cadmus conducted a preliminary study of natural gas efficiency potential.

The study involved separate assessments of energy-efficiency potential for electricity and natural gas in the residential and commercial sectors, considering a comprehensive set of energy efficient technologies. For each utility, the study covered the complete range of market segments, dwelling types, vintage, and applicable end uses, including six residential market segments (existing and new construction for single-family, multifamily, and manufactured homes);² and twenty-two commercial segments (existing and new construction for 11 building types).

Cadmus relied on secondary and primary data to conduct the analysis. Secondary data included the Company’s official load forecasts, long-term avoided costs (including annual energy and capacity values), system loss factors, and discount rate. Since the Company had already vetted the data, Cadmus did not validate them and used the data as provided. The study also included a primary data collection effort to assemble critical technical and market information specific to the Company’s service territory. Cadmus, in collaboration with EHI Consultants and Thoroughbred Research Group, conducted phone surveys of LG&E and KU residential and commercial customers as well as on-site audits of commercial customers. This primary data collection effort provided current data and a representative sample of actual market conditions in the Company’s service area.

Cadmus supplemented primary data with information from secondary sources.³ Together, they provided the foundation for estimating technical, economic, and achievable potential, defined as follows:

1. **Technical potential** assumes all technically feasible, energy-efficiency measures may be implemented, regardless of their costs or market barriers.

¹ This assessment did not include the industrial sector.

² Cadmus did not model manufactured homes for LG&E’s service territory due to the small number of manufactured homes in Louisville.

³ Secondary sources are different from “secondary data.” Secondary sources provide information not directly gathered or compiled by Cadmus, but that we consider accurate. Examples of secondary sources include the U.S. Census and Energy Information Administration websites, where we obtained supplemental technical and market data.



2. **Economic potential** represents a subset of technical potential, consisting only of measures meeting cost-effectiveness criteria based on the Company's avoided supply costs for delivering electricity and natural gas and avoided line losses. Cadmus determined the economic potential using a total resource cost test (TRC), which compares the net benefits of energy-efficiency measures with their costs.⁴
3. **Achievable potential** is defined as the portion of economic potential assumed to be reasonably achievable in the course of the planning horizon, given budgetary constraints and market barriers that may impede customers' participation in utility programs. In this study, Cadmus relied on the results of stratified, representative samples of residential and commercial customers to assess the consumers' willingness to adopt energy-efficiency measures under three scenarios, depending on the fraction of the measure's incremental cost covered by the Company incentives: (1) none, (2) 50% and (3) 75%.

To estimate technical potential, Cadmus used the industry-standard, bottom-up approach. This approach is consistent with energy-efficiency studies by Cadmus and others consultants in various jurisdictions in the United States. We began with a comprehensive review of electric and natural gas energy-efficiency measures applicable to each of the Company's sector and market segments. Using technical measure data and market characteristics, we estimated likely long-term saturations of each measure in specific sectors and market segments.

This assessment resulted in a technical potential supply curve at the measure level, which we then screened for cost-effectiveness to determine the economic potential. The study determined achievable levels of energy-efficiency potential by assessing customers' willingness to pay for energy-efficiency measures, based on survey results.

Summary of Results

This study quantifies the amount of energy and demand the Company can save in its service territory from 2014 to 2033. The Company can achieve these savings through adopting proven, commercially available energy-efficient technologies, while accounting for:

1. Changes in codes and standards (taking effect from 2014 to 2033)
2. Technical feasibility and limitations (technical potential)
3. Cost-effectiveness (economic potential); using the TRC
4. Consumers' willingness to adopt energy-efficiency measures (achievable potential)

Electric Potential

Study results indicate a cumulative 5,390 gigawatt hours (GWh) of technically feasible, electric energy-efficiency potential by 2033, the end of the 20-year study horizon, with approximately 2,527 GWh (47%)

⁴ For a description of the method for calculating the total resource costs test, see the *California Standard Practice Manual: Economic Analysis of Demand-Side Management Programs*. California Public Utilities Commission. October 2001.

of these savings proving cost-effective. The estimated amount of economic potential is equivalent to 10% of the Company's 2033 sales forecast. Economic potential is the first step in determining how much energy-efficiency potential the Company should expect to achieve from its programmatic efforts. However, it does not represent the amount which the Company might realistically expect to achieve due to well-documented market barriers, which we address in the section entitled Achievable Potential.

The residential sector represents the largest source of energy-saving potential, accounting for approximately 3,689 GWh of technically feasible, electric energy-efficiency potential and 1,716 GWh of economic potential (as shown in Table 1). The residential sector accounts for 68% of both total technical and economic potential. The commercial sector represents the largest share of the demand-saving potential, accounting for approximately 413 MW of technical potential and 238 MW of economic potential.

Commercial demand represents 57% of total technical potential and 62% of total economic potential. The estimated electric technical potential in the residential and commercial sectors translate into 726 megawatts (MW) of which 384 MW is economic savings at the time of the Company's system peak, defined as the 15th hour of the first Wednesday in August.

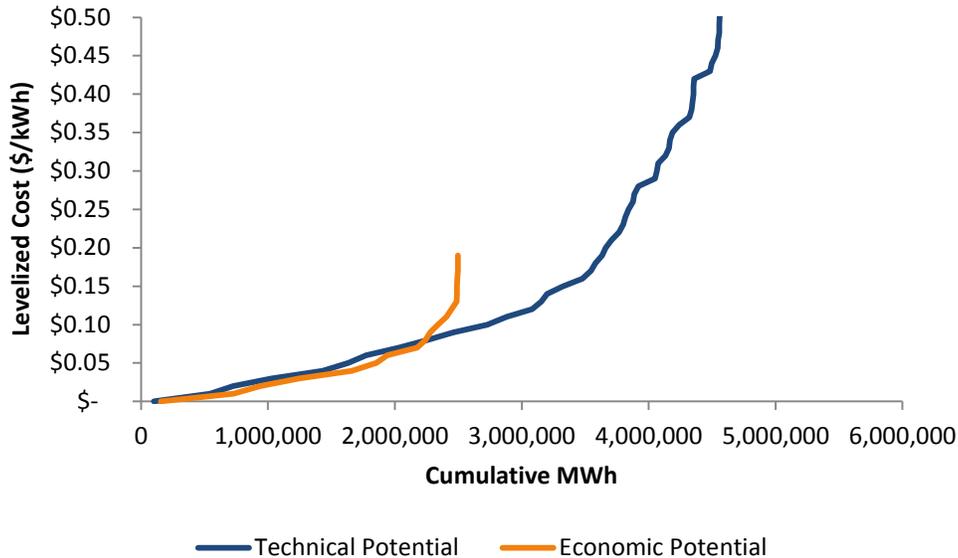
Table 1. Technical and Economic Electric Energy-Efficiency Potential (Cumulative 2033) by Sector

Sector	Base Case Sales (MWh)	Technical Potential			Economic Potential				
		MWh	Percent of Base Sales	MW	MWh	Percent of Base Sales	MW	Percent of Technical Potential - Energy	Percent of Technical Potential - Demand
Residential	14,225,644	3,689,033	26%	313	1,716,264	12%	147	47%	47%
Commercial	9,990,199	1,701,619	17%	413	810,866	8%	238	48%	58%
Total	24,215,844	5,390,653	22%	726	2,527,130	10%	384	47%	53%

Figure 1 shows the electric technical and economic energy-efficiency supply curve. The curves represent the quantity of cumulative potential (MWh) available at each levelized per-unit price point (\$/kWh).



Figure 1. Electric Energy-Efficiency Supply Curve



It is difficult to compare estimates of technical electric potential across jurisdictions. This is because the potential depends on the unique characteristics of local markets based on critical variables such as fuel and equipment saturations, climate, and historical levels of energy-efficiency programmatic activities. Notwithstanding, when Cadmus compared its estimate of technical electric potential to the Company's sales forecast for the final year of the analysis, we found the Company's results were largely comparable with the results of other electric-efficiency potential studies in other jurisdictions. For example, a review of 90 electric-efficiency potential studies completed from 2001 to 2010 showed the electric technical potential averaging at about 24% of retail sales for all sectors (within a range of about 13% to 45%).⁵ Cadmus' study estimates the Company has a technical potential of 22%, which is well within the range of the studies conducted in other jurisdictions.

The estimate of electric economic potential, measured as the percentage of retail sales, is lower than the range of 15% to 35% found in the reviewed studies for other jurisdictions. However, the difference can largely be attributed to the avoided costs and lower natural gas prices. Although the relationship between avoided costs and economic potential is not linear, avoided energy and capacity costs are the key determinants of economic potential.

Due to uncertainties inherent in future markets for energy-efficiency products and services (described in the Achievable Potential section) Cadmus did not attempt to develop a point estimate of achievable potential in this study. Rather, we developed a *range* of estimates, based on the fraction of economic potential we expect to be achievable, given customers' willingness to adopt energy-efficiency measures.

⁵ Haeri, Hossein. "Frontiers of Efficiency." Public Utilities Fortnightly: pp. 39-44. April 2011.

Cadmus gathered primary data by asking customers about their willingness to invest in energy efficiency if the Company subsidized the investment by paying 0%, 50%, or 75% of the energy-efficiency measure's incremental cost. The incentive level—0%, 50%, and 75%— was not related to the Company's avoided cost of energy or capacity. Cadmus designed this effort to gather information on which incentive levels would motivate customers to install energy efficiency measures. Table 2 shows the low, medium, and high levels of cumulative, electric energy-efficiency potential the Company can expect to be achievable over the course of this study's 20-year horizon.

Table 2. Achievable Electric Energy-Efficiency Potential (Cumulative 2033) by Sector

Sector	Base Case Sales (MWh)	Low Achievable (No Incentive)		Medium Achievable Incentives Covering 50% or Incremental Costs		High Achievable Incentives Covering 75% of Incremental Costs	
		MWh	Percent of Base Sales	MWh	Percent of Base Sales	MWh	Percent of Base Sales
Residential	14,225,644	602,136	4.2%	920,185	6.5%	1,005,172	7.1%
Commercial	9,990,199	339,437	3.4%	461,670	4.6%	473,173	4.7%
Total	24,215,844	941,572	3.9%	1,381,855	5.7%	1,478,345	6.1%

Results indicate a range of 941 GWh to 1,478 GWh of achievable electricity savings, representing, respectively, 3.9% to 6.1% of retail sales in 2033. The estimated savings have a medium achievable value of 1,381 GWh, which represents 5.7% of the baseline sales.

Natural Gas Potential

Study results indicate 96 million therms of natural gas energy-efficiency potential are technically feasible by 2033. Using the Company's avoided natural gas commodity costs to screen measures for cost-effectiveness, we expect nearly one-half of this potential (47 million therms) will be economic. This level of cost-effective potential represents 16% of the Company's projected sales in 2033.

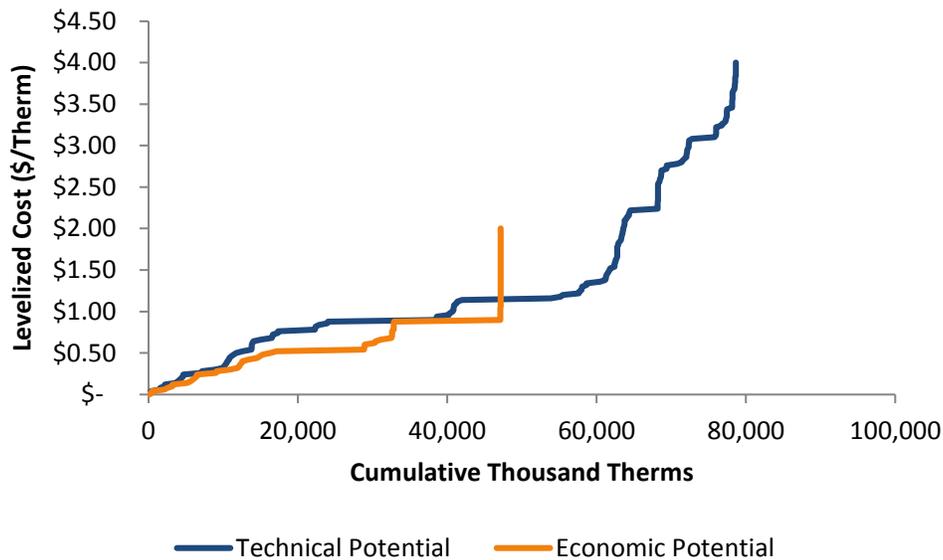
Table 3. Technical and Economic Natural Gas Energy-Efficiency Potential (Cumulative 2033) by Sector

Sector	Base Case Sales (Thousand Therms)	Technical Potential		Economic Potential		
		Thousand Therms	Percent of Base Sales	Thousand Therms	Percent of Base Sales	Percent of Technical Potential
Residential	186,454	66,230	36%	34,523	19%	52%
Commercial	102,299	30,069	29%	12,626	12%	42%
Total	288,753	96,299	33%	47,149	16%	49%



Figure 2 shows the technical and economic natural gas efficiency supply curves. Economic potential includes all measures with a benefit-to-cost ratio greater than or equal to 1.0, according to the TRC criterion.

Figure 2. Natural Gas Energy-Efficiency Supply Curve



The study results suggest about 15 million to 26 million therms of natural gas savings are achievable over the course of 20-year planning period. The results indicate the Company can expect a medium level (24 million therms) of achievable potential, representing 8% of the Company's baseline sales forecast (as shown in Table 4).

Table 4. Achievable Natural Gas Energy-Efficiency Potential (Cumulative 2033) by Sector

Sector	Base Case Sales (Thousand Therms)	Low Achievable (No Incentives)		Medium Achievable Incentives Covering 50% or Incremental Costs		High Achievable Incentives Covering 75% of Incremental Costs	
		Thousand Therms	Percent of Base Sales	Thousand Therms	Percent of Base Sales	Thousand Therms	Percent of Base Sales
Residential	186,454	10,052	5%	16,695	9%	17,449	9%
Commercial	102,299	4,659	5%	7,603	7%	8,564	8%
Total	288,753	14,711	5%	24,298	8%	26,013	9%

Planning Implications

Studies of energy-efficiency potential provide detailed information on the magnitude and timing of energy-efficiency likely to be available at the sector, market segment and end-use levels. This information is intended to provide a basis for developing and refining its portfolio of energy-efficiency programs.

Energy-efficiency measures generally fall into two categories, discretionary (retrofit) or non-discretionary (lost opportunity), differentiated primarily in terms of their availability. Discretionary measures (e.g., lighting upgrades in the commercial sector) are measures that are expected to be available immediately. Non-discretionary measures include measures that are typically implemented only on burnout of the existing equipment (normal turnover) or new construction. The key difference between the two groups of measures is that, unlike retrofit measures which, financial and practical considerations notwithstanding, may be deployed at the program administrator's discretion, the availability of lost-opportunity resources is determined by market forces that are outside the program administrator's control.

Adoption of retrofit measures is also subject to a number of constraints, primarily the customers' willingness to adopt energy-efficiency measures, the maturity of the technology, and customer awareness. The Company may overcome these barriers to some degree through programmatic efforts to raise awareness and provide financial incentives.

The results of this study show that about three-quarters (1,060 GWh) of the estimated medium-case 20-year achievable electric efficiency potential of 1,382 GWh consist of discretionary measures. Of this amount, 67% (706 GWh) is in the residential sector and 33% (354 GWh) is in the commercial sector. This translates into a levelized annual savings of roughly 35,000 MWh in the residential sector and less than 18,000 MWh per year in the commercial sector—a total of 53,000 MWh per year over the 20-year planning horizon on average.

The Company's energy-efficiency resources portfolio currently includes a wide range of energy-efficiency measures and services. In its 2012-2018 demand-side management plan, the Company expanded these offerings to achieve average annual electricity savings of 140,000 MWh for the residential sector and 60,000 MWh for the commercial sector— a combined savings of 200,000 MWh annually.

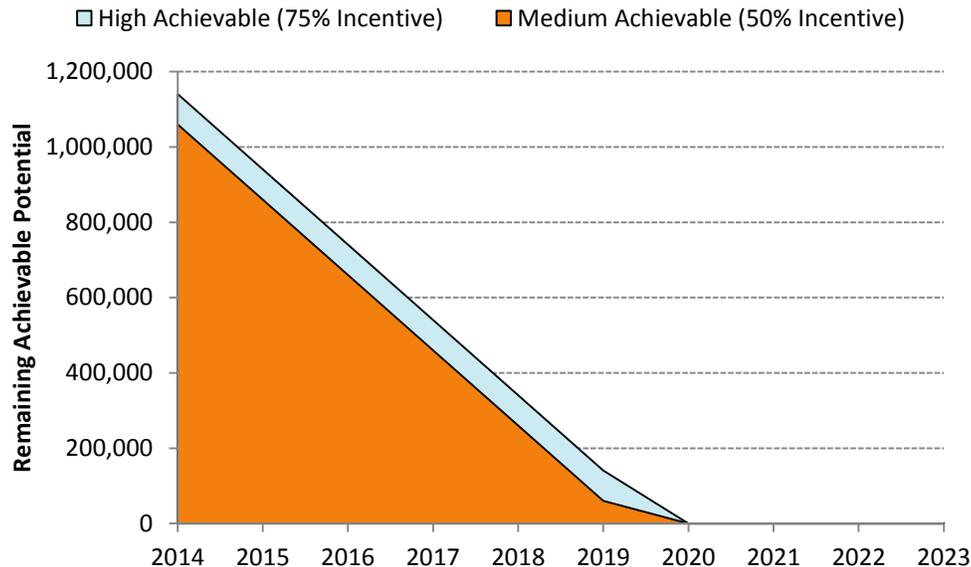
Compared to the estimated annual potential, the Company's targets are well above the 53,000 MWh estimated annual potential from the residential and commercial sectors. As illustrated in Figure 3, the results of this study indicate that the Company's planned acquisition rate of 200,000 MWh per year would deplete the medium-case achievable discretionary potential of 1,060,000 MWh in less than six years.

Moreover, over time, as the Company implements its planned programs, the cost of achieving additional savings will likely rise as the market for certain energy-efficient equipment become saturated, low-cost



saving opportunities are exhausted, or baseline energy use is lowered by stringent energy-efficiency codes and standards. To achieve this remaining potential, the Company will likely have to invest additional resources to intensify marketing efforts.

Figure 3. Remaining Medium-Case Achievable Discretionary Electric Energy-Efficiency Potential



Additional electric potential will be available in the form of non-discretionary savings from new construction and replacement of existing equipment upon burnout. Potential declines in the cost of existing energy-efficiency technologies and the emergence of new technologies might also provide additional small opportunities for further savings - although Cadmus' analysis of energy-efficiency potential is based solely on proven, commercially available technologies and current market costs.

For natural gas, the discretionary potential is 19,544 therms and the lost opportunity is 4,753 therms out of the total 24,298 therms through 2033. Unlike electric energy-efficiency, 80% of gas energy-efficiency potential comes from retrofit measures. This means savings is less dependent on new construction rates and the natural turnover of equipment.

Potential studies help inform the energy-efficiency portfolio design and program planning processes by identifying the amount and timing of energy-efficiency savings available in various end uses and market segments. Assessing the potential for energy efficiency also requires compiling a large set of data from multiple sources and applying complex calculations. These studies also rely on a large number of assumptions about future market conditions and, in the case of achievable potential, consumers' behavior. The results of these studies are also sensitive to technical and macro-economic changes that may undermine the validity of these underlying assumptions. Therefore, the Company should consider the findings and conclusions of this study as indicative of actual long-term potential and, to the extent possible, revisit the underpinning data and assumptions of the study periodically.

Organization of Report

This report presents the study's findings in two volumes. Volume I (this document), presents methodologies and findings and includes the following four sections:

1. **General Approach and Methodology** provides an overview of the methodology Cadmus used to estimate technical, economic, and achievable potential.
2. **Primary Data Collection** presents the research approach, sample frames, and key findings from the primary data collection efforts. It also summarizes the secondary data sources used.
3. **Technical and Economic Potential** presents the technical and economic potential available from energy-efficiency resources.
4. **Achievable Potential** describes the basis for and results of estimating realistically achievable energy-efficiency potential.

Volume II presents supplemental technical information, assumptions, data, and other relevant details as the following appendices:

1. Appendix A: Data Collection Instruments
2. Appendix B: Summary of Findings from Primary Data Collection
3. Appendix C: Baseline Data
4. Appendix D: Measure Descriptions
5. Appendix E: Measure Details



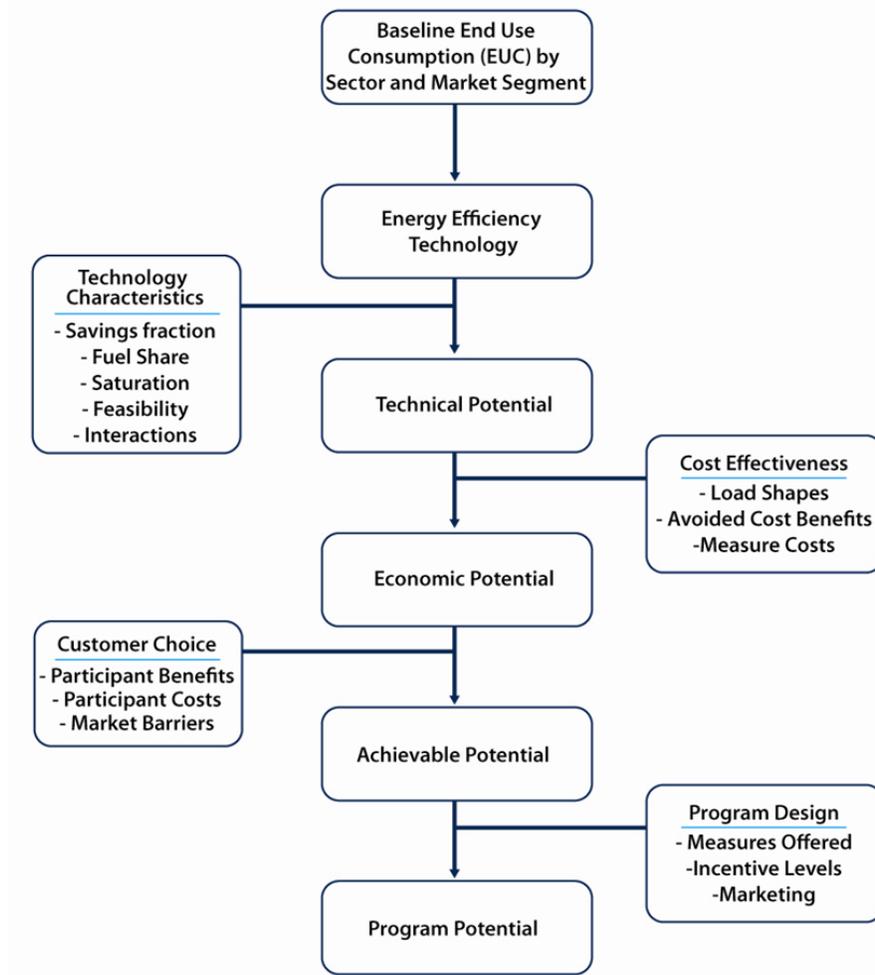
General Approach and Methodology

This assessment relies on industry best practices, analytic rigor, and flexible and transparent tools to accurately estimate the potential for energy and capacity savings in the Company's service territory, between 2014 and 2033. This section describes each step in the assessment process and summarizes the results. The appendices in Volume II of this report provide detailed study results and supplemental materials.

General Approach

The methodology used for estimating the technical, economic, and achievable energy-efficiency potential drew upon standard industry practices. Figure 4 presents the general methodology and illustrates how baseline and efficiency data are combined to estimate savings for each type of potential.

Figure 4. General Methodology for Assessment of Energy-Efficiency Potentials



In this study, Cadmus quantified three types of potential: technical, economic, and achievable. A fourth type of potential, naturally occurring efficiency, is also accounted for. However, Cadmus did not separately analyze naturally occurring efficiency because it is embedded in estimates of baseline consumption and reflected in the Company's load forecast. The types of potential are described as follow.

- **Naturally occurring efficiency** refers to reductions in energy use occurring due to normal market forces, such as technological change, energy prices, market transformation efforts, equipment turnover, and improved energy codes and standards. This analysis accounted for naturally occurring conservation in three ways:
 - First, the assessment accounted for gradual efficiency increases due to the retirement of older equipment in existing buildings, and its subsequent replacement with units meeting minimum standards (at the time of replacement). For some end uses, the technical potential associated with certain energy-efficiency measures assumed a natural adoption rate. For example, savings associated with ENERGY STAR appliances accounted for current trends in customer adoption.
 - Second, the assessment accounted for energy consumption characteristics of new construction reflecting Kentucky's adoption of the 2009 IECC building code.
 - Third, the assessment accounted for pending improvements to equipment efficiency standards, which will take effect during the planning horizon. The assessment did not, however, forecast changes to standards that have yet to pass; rather, it treated these at a "frozen" efficiency level.
- **Technical potential** assumes all technically feasible demand-side management measures may be implemented, regardless of their costs or market barriers. For energy-efficiency resources, technical potential can be divided into three distinct classes: retrofit opportunities in existing buildings; equipment replacements in existing buildings; and new construction. The first class, existing in current building stock, can be acquired at any point in the planning horizon, while end-use equipment turnover rates and new construction rates dictate the timing of the other two classes.
- **Economic potential** represents a subset of technical potential, consisting only of measures meeting the cost-effectiveness criteria based on the Company's avoided energy and capacity costs. For each energy-efficiency measure, the study structures the benefit-cost test as the ratio of the net present values of the measure's benefits and costs, and only measures with a benefit-to-cost ratio of 1.0 or greater can be deemed cost-effective.
- **Achievable potential** derives from the portion of economic potential that might be assumed reasonably achievable in the course of the planning horizon, given market barriers that might impede customer participation in utility programs. Achievable potential can vary greatly, based on program incentive structures, marketing efforts, energy costs, customer socio-economic characteristics, and other factors.



This report does not consider program potential: the amounts of energy savings likely to be achievable annually once the utility's specific program design components—such as measures offered, incentive structures, marketing efforts, and program budget constraints—have been taken into account.

Overview of Approach

Estimating energy-efficiency potential is based on a sequential analysis of various energy-efficiency measures in terms of technical feasibility (technical potential), cost-effectiveness (economic potential), and expected market acceptance, considering normal barriers possibly impeding measure implementation (achievable technical potential). The assessment followed four steps:

1. **Developing baseline forecast:** Determining 20-year future energy consumption by fuel, sector, market segment, and end use. The study calibrated the base year, 2013, to the Company's sector load forecasts. As previously described, baseline forecasts shown in this report include estimates of naturally occurring potential.
2. **Estimating technical potential:** Estimating technical potential, based on alternative forecasts that reflect technical impacts of specific energy-efficiency measures.
3. **Estimating economic potential:** Estimating technical potential, based on forecasts that reflect technical impacts of cost-effective energy-efficiency measures.
4. **Estimating achievable potential:** Achievable potential, calculated by applying ramp rates and an achievability percentage to cost-effective measures (as detailed later in this section).

Developing Baseline Forecast

Collecting Baseline Data

Creating a baseline forecast requires multiple data inputs to accurately characterize energy consumption in the Company's service area. These key inputs include:

- Sales and customer forecasts;
- Major customer segments (e.g., residential dwelling types or commercial business types);
- End-use saturations;
- Equipment saturations;
- Fuel shares;
- Efficiency shares (the percentage of equipment below, at, and above code); and
- Annual end-use consumption estimates, by efficiency level.

Data specific to the Company's service territory not only provided the basis for baseline calibration, but supported estimation of technical potential. As described in the Primary Data Collection section, the assessment conducted a significant primary data collection effort to ensure use of the best available data. The Company also provided data on actual and forecasted sales and customers by sector. Table 5 identifies sources for key data.

Table 5. Data Sources

Data	Residential	Commercial
Baseline sales and customers	Company actual	Company actual
Forecasted sales and customers	Company forecast	Company forecast
Percent of sales by building type	Company customer database	Company customer database
End-use energy consumption	Company load forecast, building simulations, Energy Information Agency (EIA) <i>Residential Energy Consumption Survey</i> (RECS), ENERGY STAR, and others.	Company load forecast, EIA <i>Commercial Building Energy Consumption Survey</i> (CBECS)
Saturations and fuel shares	Company <i>Residential Appliance Saturation Survey</i> (RASS), Cadmus phone survey, RECS	Company saturation survey, Cadmus phone survey and site visits, CBECS
Efficiency shares	Company RASS, Cadmus phone survey, RECS	Company saturation survey, Cadmus phone survey and site visits, CBECS
Energy-efficiency measures	Cadmus measure list	Cadmus measure list

Preparing the Baseline Forecast

The baseline forecast for each customer sector derived from the baseline data (described above) to obtain estimates of average consumption by market segment, construction vintage, and end use; and then summing the data to the sector level. The end-use and customer sector forecasts were then calibrated to the Company's official forecast to evaluate the accuracy of Cadmus' forecast and to ensure its consistency with the Company forecast. This approach offered the following key advantages:

- The method derived savings estimates using a baseline calibrated to official sales forecasts, which required care to ensure underlying inputs and assumptions were reasonable and consistent with other known customer characteristics.
- The forecasts incorporated the effects of equipment standards and naturally occurring efficiency improvements resulting from usage reductions, upon the retirements of lower-efficiency equipment and their replacement with higher-efficiency units. Ensuring that the baseline forecast accounted for these effects prevented potential estimates from being inflated by naturally occurring efficiency, thus double-counting the potential.
- The same assumptions underlying the baseline forecasts were used to develop the energy-efficiency measure inputs as well as estimates of technical potential, ensuring consistency.

Incorporating Impending Codes and Standards

The importance of accurately accounting for changes in codes and standards over the planning horizon cannot be overstated. Not only do these changes affect customers' energy consumption patterns and behaviors, but they determine which energy-efficiency measures continue to produce savings over



minimum requirements. This study captured current efficiency requirements as well as those enacted, but not yet taking effect.

Cadmus' analysis did not attempt to predict how energy codes and standards might change in the future; rather it factored in only the enacted legislation, notably, the provisions of the 2007 Energy Independence and Security Act (EISA), known to take effect over the course of this analysis.

EISA requires general service lighting to become roughly 30% more efficient than current incandescent technology, with standards phased in by wattage from 2012 to 2014. In addition to the 2012 phase-in, EISA includes a backstop provision, requiring still higher-efficiency technologies beginning in 2020. Capturing the effects of this legislation proved especially important, as residential lighting has played a large role in the Company's energy-efficiency programs over the past several years.

Moreover, this study explicitly accounted for several other pending federal codes and standards. For the residential sector, these include appliances, HVAC, and water heating standards. For the commercial sector, these include appliances, motors, water heating, HVAC, and lighting standards. Table 6 provides a comprehensive list of standards considered in this study.

Table 6. Federal Equipment Standards

Equipment Type	Existing (Baseline) Standard	New Standard	Sector	Year Effective*
Appliances				
Clothes Washer	MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer, MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Residential	2016
Clothes Washer	MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer, MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Residential	2018
Commercial Refrigeration Equipment (semi-vertical and vertical cases)	Commercial refrigeration equipment 2010 (varies by equipment class)	Commercial Refrigeration Equipment 2012 (varies by equipment class)	Commercial	2012
Cooking Oven	National Appliance Energy Conservation Act 1990	Range and Oven Standards 2012	Residential	2012
Dehumidifier	Federal standard: 2007 dehumidifier	Federal Standard 2012 Dehumidifier	Residential	2013*
Dishwasher	Federal standard: 2010 dishwasher (355 kWh/yr and 6.5 gal/cycle)	Federal Standard 2014 Dishwasher, 307 kWh/yr and 5.0 gal/cycle	Commercial/Residential	2014*

Equipment Type	Existing (Baseline) Standard	New Standard	Sector	Year Effective*
Dryer	Standard dryer with controls and moisture sensor (CEF/EF 3.14/3.19)	Federal Standard 2015 Dryer, CEF/EF 3.73/3.83	Residential	2015
Freezer	Federal Standard, 2001 freezer	Federal Standard 2014 Freezer	Commercial/Residential	2015*
Refrigerator	Refrigerator: Federal standard 2001	Refrigerator, Federal Standard 2014	Commercial/Residential	2015
Vending Machines	Existing conditions (no Federal standard prior to 2012)	Vending Machines, Federal Standard 2012	Commercial	2012
Motors				
Small Electric Motors	NEMA standards, Publication MG1-1987	Small Electric Motor Standard 2015	Commercial	2015
Water Heaters				
Water heater > 55 gallons	Federal standard 2004 storage water heater (EF 0.87)	Federal Standard 2015 Heat Pump Water Heater, EF 1.97	Commercial/Residential	2015
Water Heater ≤ 55 gallons	Federal standard 2004 storage water heater (EF 0.92)	Federal Standard 2015 Storage Water Heater, EF 0.95	Commercial/Residential	2015
HVAC				
Boiler	National Appliance Energy Conservation Act of 1987 (80% AFUE)	Federal Standard 2012 Boiler, 82% AFUE	Commercial/Residential	2012*
Central Air Conditioner	Federal standard 2006 central air conditioner: SEER/EER 13/11 (split system)	Federal Standard 2015 Central Air Conditioner, SEER/EER 14/12 (split system)	Residential	2015
Heat Pump (Air Source)	Federal standard 2006 heat pump: SEER 13 and HSPF 7.7 (split system)	Federal Standard 2015 Heat Pump, SEER 14 and HSPF 8.2 (SPLIT SYSTEM)	Residential	2015
Lighting				
Lighting General Service Fluorescent Lamp (EISA)	Fluorescent linear tube standards, 1995	Linear Tube Fluorescent Lamp Standards 2012	Commercial/Industrial	2012
Lighting General Service Lamp (EISA)	Existing conditions (no federal standard prior to EISA 2007)	EISA of 2007 (phased in over 3 years)	Commercial/Residential	2012, 2013, 2014



Equipment Type	Existing (Baseline) Standard	New Standard	Sector	Year Effective*
Lighting General Service Lamp (EISA backstop provision)	Existing conditions (no federal standard prior to EISA 2007)	EISA Backstop Provision 2020	Commercial/Residential	2020
Lighting Specialty Lamp (EISA incandescent reflector lamps)	IRL standards, 1995	EISA of 2007 Impacts, 2.5 Inch Diameter Reflectors and Above 2012	Residential	2013

*Standards taking effect mid-year are assumed to begin on January 1 of the following year.

To ensure accurate assessment of the remaining potential, Cadmus accounted for the effects of future standards. Drawing upon a strict interpretation of the legislation, Cadmus’s analysis assumed affected equipment would be replaced with more efficient alternatives that meet the minimum federal standards, in other words, complete compliance. Once fully implemented, the savings from pending federal standards are estimated to lower the residential and commercial electricity consumption respectively by 6% and 4% from their baseline levels.

Lighting standards are the primary cause of this lower consumption. This is mostly due to a fall in 2020 consumption stemming from the pending EISA backstop provision, which requires standard, screw-base bulbs to achieve a minimum efficacy of 45 lumens per watt. Figure 5 and Figure 6 break out the impacts of federal standards on the residential and commercial sector electric energy-efficiency potential. The dramatic change in Figure 6 in 2020 reflects the taking effect of EISA’s backstop lighting provision.

Figure 5. Residential Electric Potential from Federal Standards by End Use

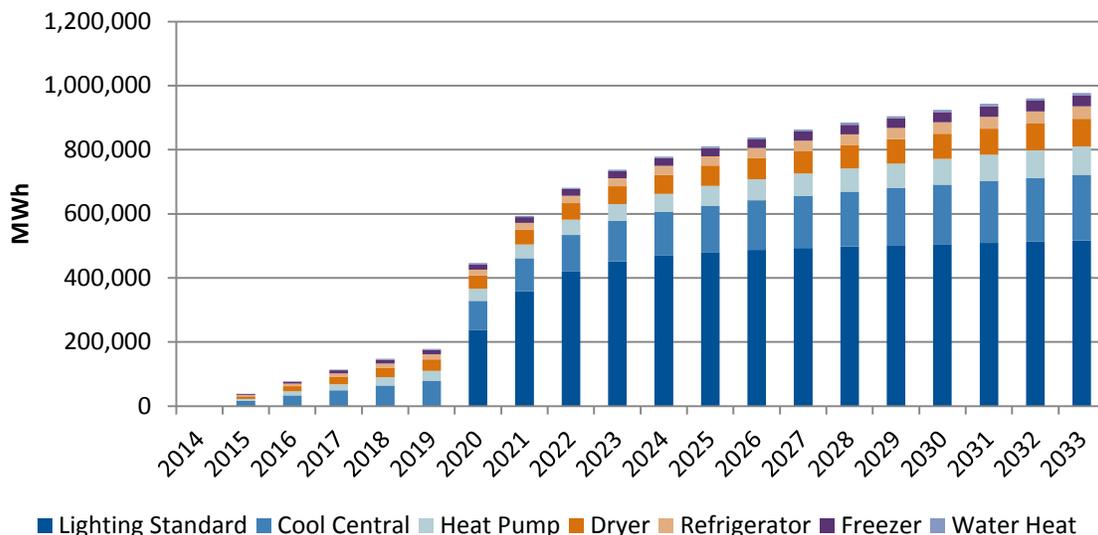
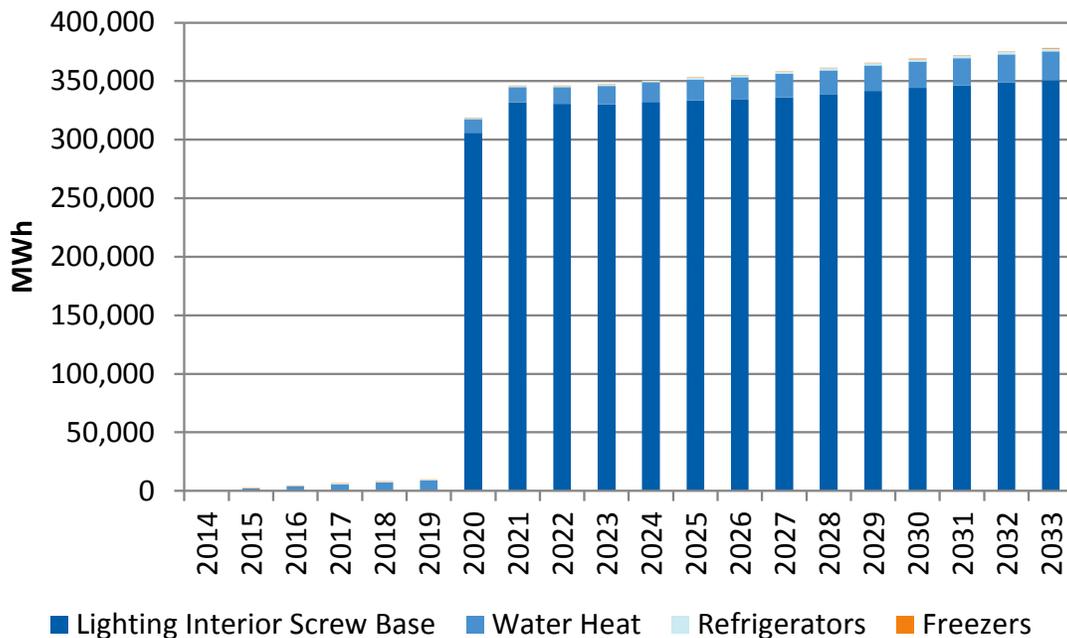


Figure 6. Commercial Electric Potential from Federal Standards by End Use

Compared to electricity, federal gas equipment federal standards are expected to have a much smaller impact on energy-efficiency potential. Pending federal natural gas standards account for 2% of residential natural gas sales and 1% of commercial natural gas sales.

Accounting for Naturally Occurring Efficiency

Cadmus' baseline forecast included naturally occurring efficiency—that is, reductions in energy use likely to occur from normal market forces (such as technological change, energy prices, market transformation efforts, and higher energy codes and standards). The analysis accounted for naturally occurring efficiency in four ways:

1. The potential associated with certain energy-efficiency measures assumed a natural adoption rate, net of current saturation. For example, total potential savings associated with ENERGY STAR appliances accounted for current adoption trends.
2. The assessment accounted for gradual efficiency increases due to retiring older equipment in existing buildings, followed by replacement with units meeting or exceeding minimum standards at the time of replacement.
3. The assessment accounted for pending improvements to equipment efficiency standards taking effect during the planning horizon (as discussed). The assessment did not, however, forecast changes to standards not yet adopted.
4. Estimates of energy consumption in new construction reflected 2009 IECC. All energy-efficiency measures in this study were assumed to meet or exceed 2009 IECC, and, where applicable, the study calculated energy savings using 2009 IECC as baseline. For example, current building code



requires R-38 ceiling insulation; so energy savings for all ceiling insulation measures in new construction were calculated with R-38 as a baseline. Consequently, this study did not attribute savings to ceiling insulation levels below R-38 in new construction. Note: building codes have the smallest impact of the four classes of naturally occurring efficiency, given they only apply to new construction.

Compiling Energy Efficiency Technology Data

Cadmus created a comprehensive list of electric and natural gas energy-efficiency measures applicable to the Company's service territory. This list included all measures currently offered through the Company's existing energy-efficiency programs as well as measures included in databases compiled in other jurisdictions, such as California's Database for Energy Efficient Resources (DEER).⁶ Energy-efficiency measures were classified into two categories:

1. High-efficiency equipment measures (e.g., high-efficiency central air conditioners), which replace inefficient end-use equipment, and follow normal replacement patterns, based on expected lifetimes.
2. Non-equipment measures, which affect end-use consumption without replacing end-use equipment (e.g., insulation). Such measures, which do not include timing constraints from equipment turnover (except for new construction), should be considered discretionary (not dependent on equipment turnover), as savings can be acquired at any point over the planning horizon.

These measures required a number of inputs to accurately assess their saving potential and cost-effectiveness. Whenever possible, inputs derived from the primary data collection activities described in this report, supplementing data with local, regional, and national data, where appropriate. Descriptions follow of relevant inputs for each measure type.

Equipment and Non-equipment Measures

- Equipment cost: full or incremental, depending on nature of the measure and application.
- Labor cost: the expense of installing the measure, accounting for differences in labor rates by region, urban/rural, and other variables.
- Energy and demand savings: average annual savings attributable to installing the measure, in absolute and/or percentage terms.

Non-equipment Measures Only

- Technical feasibility: the percentage of buildings where this measure can be installed, accounting for physical constraints.
- Percent incomplete: the percentage of buildings not already installing the measure, though its installation remains technically feasible.

⁶ <http://www.deeresources.com/>

- Measure competition: for mutually exclusive measures, accounting for the percentage of each measure likely installed (to avoid double-counting savings).
- Measure interaction: accounting for end-use interactions (e.g., a decrease in lighting power density causing heating loads to increase).

For more detailed descriptions of analyzed measures as well as their inputs and outputs, see Appendix D of this report.

Estimating Technical Potential

Once Cadmus fully populated the measure database, measure-level inputs were used to estimate technical potential over the planning horizon. This process began by estimating savings from all measures included in the analysis, and then aggregating the results to the end use, market segment, and sector levels.

This approach began by characterizing individual measure savings, first in terms of the percentage of end-use consumption. For each non-equipment measure, the study estimated absolute savings using the following basic relationship:

$$SAVE_{ijm} = EUI_{ije} * PCTSAV_{ijem} * APP_{ijem}$$

Where:

$SAVE_{ijm}$ = annual energy savings for measure m for end use j in customer segment i

EUI_{ije} = calibrated annual end-use energy consumption for equipment e for end use j and customer segment i

$PCTSAV_{ijem}$ = the percentage savings of measure m , relative to the base usage for the equipment configuration ije , accounting for interactions among measures, such as lighting and HVAC calibrated to annual end-use energy consumption

APP_{ijem} = measure applicability: a fraction representing a combination of the technical feasibility, existing measure saturation, end-use interaction, and any adjustments to account for competing measures

For example, for wall insulation saving of 10% of space heating consumption, the final percentage of the end use saved would be 5%, assuming an overall applicability of 50%. This value represented the percentage of baseline consumption the measure saved in an average home.

However, capturing all applicable measures required examining many instances where multiple measures affected a single end use. To avoid overestimating total savings, assessing cumulative impacts accounted for interactions among the various measures—a treatment called “measure stacking.” The primary method to account for stacking effects establishes a rolling, reduced baseline, applied sequentially upon assessment of measures in the stack. The equations below illustrate this technique, applying measures 1, 2, and 3 to the same end use:



$$SAVE_{ij1} = EUI_{ije} * PCTSAV_{ije1} * APP_{ije1}$$

$$SAVE_{ij2} = (EUI_{ije} - SAVE_{ij1}) * PCTSAV_{ije2} * APP_{ije2}$$

$$SAVE_{ij3} = (EUI_{ije} - SAVE_{ij1} - SAVE_{ij2}) * PCTSAV_{ije3} * APP_{ije3}$$

After iterating all measures in a bundle, the final percentage of the reduced end-use consumption provided the sum of the individual measures' stacked savings, divided by the original baseline consumption.

Economic Potential

The methodology for estimating economic potential was based on the methods described in the California Standard Practice Manual (SPM),⁷ which establishes the procedures for economic evaluation from the perspectives of participants, utility (or program administrator), total resource cost, societal and all ratepayers. Consistent with standard practice in the industry, the analysis of economic potential in this study relied on the total resource cost (TRC) test as the criterion for screening energy efficiency measures for cost-effectiveness.

For each measure, the application of TRC began with the valuation of the measure's benefits, as measured by the avoided energy and capacity costs and avoided line losses, and comparing the result to the measure's costs. For equipment measures, costs were calculated based on the measure's incremental costs, compared with the cost of baseline technology. For retrofit measures, measure costs included the total installed cost of the measure. The study considered a measure cost-effective if the net present value of its benefits exceeded the net present value of its costs as measured according to the TRC test, that is:

$$\frac{\text{TRC Benefits}}{\text{TRC Costs}} \geq 1$$

Where:

$$\text{TRC Benefits} = NPV \left(\sum_{\text{year}=1}^{\text{measure life}} \left(\sum_i^{i=8760} (\text{impact}_i \times \text{avoided cost}_i) \right) \right)$$

And:

$$\text{TRC Costs} = NPV (\text{incremental -or total - installed measure cost})$$

Economic potential represented the savings from the subset of measures that passed the cost-effectiveness criterion according to the TRC test.

⁷ California Standard Practice Manual for Economic Analysis of Demand-Side Programs and Projects, California Public Utilities Commission, 2002.

Calculating a measure's total resource benefits utilized the following data:

- **End-use load shapes:** End-use consumption patterns by costing period, applied to electric and natural gas measures, and capturing the time-differentiated value of energy savings, and determining the amount of savings during peak periods.
- **Line losses:** Representing energy lost between the generator and the customer meter. Thus, energy and capacity savings at the customer meter would be grossed up, capturing the true value of savings. Cadmus used electric line loss of 5.8% for LG&E, 6.2% for KU, and a natural gas line loss of 3.1%, provided by the Company.
- **Discount rate:** A discount rate of 6.86% for LG&E and 6.67% for KU, which represents the weighted average cost of capital.
- **Utility avoided energy costs:** Company's projections of time and seasonally differentiated electric energy and natural gas commodity costs.
- **Utility avoided capacity costs:** The Company's projections of the cost of supplying power during peak periods, estimated by the Company at \$100/kW-year.

Line loss factor, discount rate, avoided energy and avoided capacity costs were provided to Cadmus by the Company.

Based on the results from the cost-effectiveness analysis, and using the same method described in the technical potential section, Cadmus developed an alternate supply curve consisting of measures passing the cost-effectiveness criterion from the TRC perspective.



Primary Data Collection

Overview

Assessment of the energy-efficiency potential required compiling technical and market data unique to the Company service territory. These data included baseline data on equipment and fuel saturations and building characteristics as well as measure-specific data, such as costs, savings, and the current saturation of energy-efficiency measures.

The primary data collection was a joint effort between Cadmus and the Louisville-based firms of EHI Consultants, an engineering and planning firm and Thoroughbred Research Group, a market research firm. EHI Consultants conducted primary data collection for the residential phone surveys and the commercial site visits and Thoroughbred Research Group Conducted the commercial phone surveys.

Cadmus first reviewed the results of past surveys completed by the Company and identified areas where additional primary research was required. A series of primary data collection efforts were undertaken to supplement existing Company data and to maximize the amount of available data specific to the Company's service territory. These efforts included surveys of residential and nonresidential customers as well as nonresidential site visits. In summary, the data collection activities were:

- Residential customer phone surveys
- Nonresidential customer surveys
- Nonresidential customer on-site surveys

The principal objective in conducting the surveys and site visits was to produce estimates of equipment saturations, customer demographics, customers' attitudes towards energy efficiency, and customers' willingness-to-adopt various energy-efficiency measures. Cadmus produced a residential sample stratified by utility (LG&E or KU) and building type (single family, multifamily, and manufactured). Targets for each stratum reflect distributions provided by the Company. Table 7 shows targeted sample sizes for residential phone surveys.

Table 7. Residential Phone Survey Sample Targets

Building Type	LG&E	KU	Total
Single Family	150	142	292
Multifamily	50	48	98
Manufactured	0	10	10
Total	200	200	400

For commercial phone surveys and site visits, Cadmus focused on segments that represented the largest share of non-residential sales and the greatest energy-efficiency opportunities. The office, retail, and restaurant segments accounts for roughly 40% of the Company's non-residential load. Cadmus stratified phone survey samples by these segments, as well as by utility. Table 8 shows commercial phone survey sample targets.

Table 8. Commercial Phone Survey Sample Targets

Segment	LG&E	KU	Total
Small Retail	16	17	33
Large Retail	17	17	34
Small Office	17	17	34
Large Office	16	17	33
Restaurant	33	33	66
Total	99	101	200

For site visits, Cadmus focused on the two top-consuming commercial segments—retail and offices. We broke each segment into large and small strata. Cadmus identified large and small offices by looking at peak consumption. Cadmus considered offices with a peak of 100 kW or more, “Large” and retail facilities with a peak of 33 kW or more “large.” Any buildings with demand below these thresholds fell into the “small” strata. Table 9 shows sample targets for commercial site visits.

Table 9. Commercial Site Visit Sample Targets

Utility	Facility Type				Total
	Retail		Office		
	Large	Small	Large	Small	
LG&E	6	7	6	6	25
KU	6	6	6	7	25
Total	12	13	12	13	50

The following section describes methods used to design and implement the surveys, and presents key findings for each surveyed group. Survey instruments and detailed results can be found in Appendices A and B, respectively.

Residential Phone Surveys

Cadmus and EHI Consultants completed 418 residential surveys to help inform the energy-efficiency potential study and program planning work. The purpose of these surveys was to gather primary research from the KU and LG&E’s residential customers on the following research topics:

- Assess awareness, perceptions, actions related to energy efficiency
- Assess efficiency program awareness and perceptions
- Assess key factors affecting program participation
- Characterize customers’ willingness to adopt energy-efficiency measures
- Gather customer demographic and household information
- Gather supplemental saturation data



Cadmus previously reported on the results of the energy-efficiency awareness, program awareness and perceptions, and program participation to the Company. The memo discussing these results is included in Appendix B. The remainder of this section discusses: customers' willingness to adopt efficiency measures, demographics and household information, and supplemental saturation data used in estimating potentials. Table 10 shows the number of surveys completed in each service territory for the single family, multifamily, and manufactured home segments.

Table 10. Completed Residential Phone Surveys

Segment	KU	LG&E	Total
Single Family (SF)	159	150	309
Multifamily (MF)	48	50	98
Manufactured Home (MH)	11	n/a	11
Total	218	200	418

The LG&E residential phone survey sample did not contain manufactured homes as these structures represent a small percentage of LG&E's residential customers.

Demographics and Household Information

The residential phone survey included several questions intended to gather additional, descriptive information about the housing stock. Though used for a number of purposes, this information primarily helped characterize the energy-efficiency measures' savings used in estimating the energy-efficiency potential. An important input to the engineering calculations was the average square footage of homes in the two service territories. Table 11 provides the results of the phone survey question asking respondents to provide their homes' square footage. Values in the "N" column indicate the number of valid (non-missing) responses.

Table 11. Average Home Square Footage

Utility	Segment	Average Square Feet	N
KU	SF	2,164	102
KU	MF	1,148	24
KU	MH	1,140	9
LG&E	SF	1,656	109
LG&E	MF	992	32

The average number of stories for single-family homes served as another important input into the engineering calculations for energy-efficiency savings.

Table 12 shows the average number of stories for single-family homes in KU's and LG&E's territories and the number of respondents to this question.

Table 12. Average Number of Stories for Single Family Homes

Utility	Average Number of Stories	N
KU	1.52	159
LG&E	1.53	146

The number of occupants per residential dwelling provides an important input in calculating savings for the number of energy-efficiency measures. **Error! Not a valid bookmark self-reference.** shows the average number of occupants for each dwelling type, according to survey respondents.

Table 13. Average Number of Occupants by Utility and Home Type

Utility	Segment	Average Number of Occupants	N
KU	SF	2.67	159
KU	MF	1.67	46
KU	MH	2.18	11
LG&E	SF	2.57	144

Supplemental Saturation Data

The residential phone survey sought to capture additional data on saturations of measures and end uses considered in the potential assessment, but not characterized by the secondary data sources. The majority of saturation data derived from surveys completed by the Company in 2010 and 2011. Once Cadmus reviewed these data sets, a small battery of questions was added to the residential phone surveys to capture the necessary data.

Table 14 provides saturation data gathered from the residential phone surveys for cable television receivers (also referred to as television set-top boxes) by segment, for both KU and LG&E.

Table 14. Average Number of Television Set Top Boxes

Utility	Segment	Average Number of Set Top Boxes	N
KU	SF	2.18	133
KU	MF	1.48	33
KU	MH	1.25	9
LG&E	SF	2.03	116
LG&E	MF	1.48	44

Table 15 provides saturation data gathered from the residential phone surveys for home audio systems by segment for both KU and LG&E.

**Table 15. Average Number of Home Audio Systems**

Utility	Segment	Average Number of Audio Systems	N
KU	SF	1.10	47
KU	MF	1.08	12
KU	MH	1.00	3
LG&E	SF	1.30	51
LG&E	MF	1.25	12

Table 16 provides saturation data gathered from the residential phone surveys for personal computers by segment, for both KU and LG&E.

Table 16. Average Number of Personal Computers

Utility	Segment	Average Number of Personal Computers	N
KU	SF	1.56	121
KU	MF	1.20	30
KU	MH	1.00	7
LG&E	SF	2.02	108
LG&E	MF	1.65	35

Table 17 provides saturation data gathered from the residential phone surveys for computer monitors by segment, for both KU and LG&E.

Table 17. Average Number of Computer Monitors

Utility	Segment	Average Number of Computer Monitors	N
KU	SF	1.02	122
KU	MF	0.70	30
KU	MH	0.71	7
LG&E	SF	1.08	105
LG&E	MF	0.79	33

Commercial Phone Surveys

The Cadmus team and Thoroughbred Research Group conducted 196 surveys to inform the energy-efficiency potential study and the program planning work. The surveys sought to gather primary research from KU's and LG&E's commercial customers in the office, retail, and restaurant segments regarding the following research topics:

- Assess awareness, perceptions, and actions related to energy-efficiency;
- Assess efficiency program awareness and perceptions;
- Assess key factors affecting program participation;

- Characterize customers' willingness to adopt energy-efficiency measures;
- Gather data to supplement existing saturation data; and
- Gather building characteristic information.

Table 18. Commercial Phone Surveys by Segment

Segment	Number of Respondents	Percent
Office Large	33	17%
Office Small	34	17%
Restaurant	58	30%
Retail Large	34	17%
Retail Small	37	19%
Total	196	100%

Commercial Supplemental Saturation Data

The commercial phone surveys provided supplemental saturation data that augmented the available information from existing data sources. The most important of these was water heating.

Given the upcoming change to the federal standard for water heating, Cadmus' potential modeling separated water heating into two end uses, based upon the size the water heater. The federal standard change in 2015 requires heat pump water heaters for electric systems larger than 55 gallons and condensing water heaters for gas systems of the same size. The heat pump water heater requirement does not apply to units with tanks that are 55 gallons or smaller.

Table 19 provides the saturation data for water heaters greater than (GT) 55 gallons and for those equal to or less than (LE) 55 gallons.

Table 19. Commercial Water Heater Size Breakout

Segment	End Use	Count	Saturation
Office Large	GT 55 Gal	13	35%
Office Large	LE 55 Gal	24	65%
Office Small	GT 55 Gal	2	5%
Office Small	LE 55 Gal	36	95%
Restaurant	GT 55 Gal	42	51%
Restaurant	LE 55 Gal	40	49%
Retail Large	GT 55 Gal	9	21%
Retail Large	LE 55 Gal	34	79%
Retail Small	GT 55 Gal	6	16%
Retail Small	LE 55 Gal	32	84%
Total	GT 55 Gal	72	30%
Total	LE 55 Gal	166	70%

In addition to capturing information on water heater tank size, Cadmus also assessed fuel saturations for the end use. Table 20 provides fuel shares from our survey data. Survey question counts did do not



match those from the previous table due to a number of survey respondents knowing the number and heating source of the water heaters on their site, but not the size of the units.

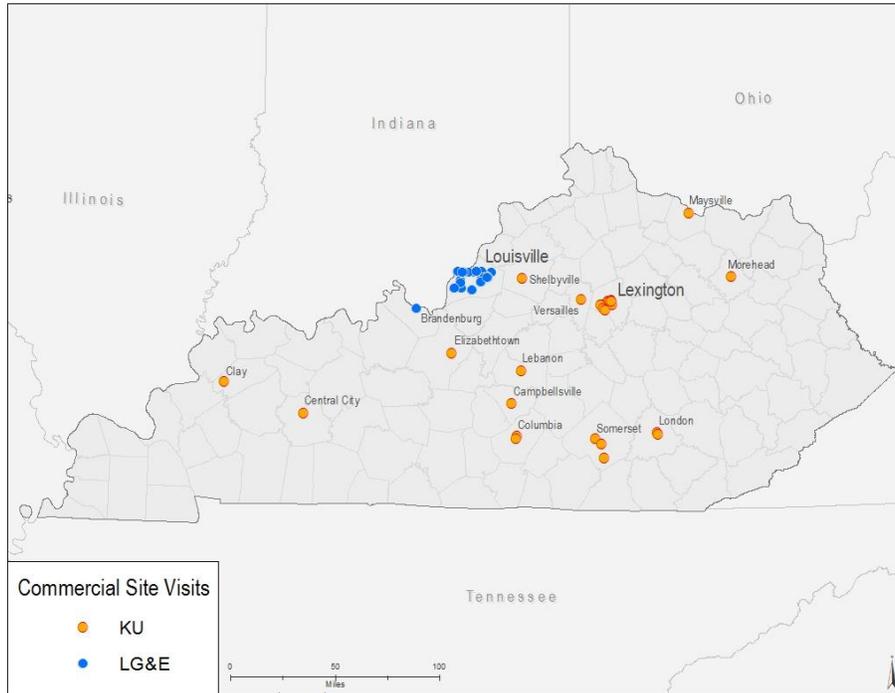
Table 20. Commercial Water Heater Fuel Shares

Segment	Fuel	Count	Fuel Share
Office Large	Electric	38	52%
Office Large	Natural Gas	35	48%
Office Small	Electric	32	55%
Office Small	Natural Gas	26	45%
Restaurant	Electric	53	45%
Restaurant	Natural Gas	64	55%
Retail Large	Electric	40	67%
Retail Large	Natural Gas	20	33%
Retail Small	Electric	42	72%
Retail Small	Natural Gas	16	28%
Total	Electric	205	56%
Total	Natural Gas	161	44%

Commercial On-Site Surveys

The Cadmus team visited 50 commercial sites, divided evenly between the KU and LG&E service territories. The two commercial segments were also divided evenly between office and retail. Figure 7 shows the geographic distribution of the visited sites. The surveys focused primarily on two commercial market segments: office buildings and retail facilities, which generally account for a significant portion of energy-efficiency potential in the commercial sector.

Figure 7. Commercial Site Visit Map



These surveys primarily sought to provide additional validation for the phone surveys and to collect data on system and equipment saturations, particularly interior lighting, which typically represents a significant source of energy savings. These data formed the basis for calculating lighting power density (LPD), a critical variable in calculations of savings potential. LPD is measured as the total number of watts of lighting usage, divided by the total square feet of the interior space. Table 21 shows the LPD values for retail and office building types in the commercial site visits.

Table 21. Commercial LPD

Segment	LPD (watts/sq. ft.)
Office (N = 24)	1.46
Retail (N = 23)	1.82

Survey results indicated retail facilities had a higher LPD (by 24%) than office buildings. For reference, the 2009 IECC requires an LPD of 1 watts/ft² for offices and 1.5 watts/ft² for retail. The site visit data also estimated the interior lighting percentages by lamp type. Each lamp type’s saturation was expressed as its percentage share of the total watts within the interior space of the building surveyed. Table 22 provides saturations of interior lighting by lamp type for the office and retail segments.

Table 22. Interior Lighting Saturations by Lamp Type

Interior Lamp Type	Office (N = 24)	Retail (N = 23)
Fluorescent	80%	87%



CFL	8%	1%
Incandescent	10%	8%
Other	1%	4%

Cadmus' analysis separated interior lighting into fluorescent, HID, other, and screw-based lamp categories. The survey captured additional saturation information on these categories, with the results discussed below. Table 23 provides the saturation data for general linear fluorescent lighting lamp types as a percentage of the overall linear fluorescent wattage within the given segments. As seen, the penetration of efficient linear fluorescent lighting is low for both office and retail segments. The surveys provided adequate information on the saturation of HID lamps in the two segments.

Table 23. Distribution of Interior Linear Fluorescent Lamp Types

Fluorescent Lamp Type	Office (N = 24)	Retail (N = 23)
T12	61%	72%
Standard T8	29%	28%
Reduced Wattage T8	0%	0%
High Performance T8	8%	0%
T5	2%	0%
High Output T5	0%	0%

Table 24 provides saturation data for interior screw-based lighting lamp types as a percentage of the overall screw-based wattage within the given segments.

Table 24. Distribution of Interior Screw-Based Lighting by Bulb Type

Screw-based Lamp Type	Office (N = 24)	Retail (N = 23)
Incandescent	75%	84%
CFL	25%	16%

Technical and Economic Potential

Scope of Analysis

The study separately assessed technical and economic potential for electricity and natural gas in the residential and commercial sectors. Within each utility's sector-level assessment, the study further distinguished among market segments or business types, vintage, and applicable end uses within each, as follows:

- Six residential segments (existing and new construction for single-family, multifamily, and manufactured);⁸ and
- Twenty-two commercial segments (11 building types within existing and new construction).

Analysis began by assessing the technical potential for 252 unique electric and 113 unique gas energy-efficiency measures (shown in Table 25), representing a comprehensive set of electric and natural gas energy-efficiency measures applicable to local climate and customer characteristics.

Table 25. Energy-Efficiency Measure Counts

Sector	Unique Measures	Permutations by Market Segment and Vintage
Electric		
Residential	95	1,677
Commercial	157	6,806
Natural Gas		
Residential	56	379
Commercial	57	1,464

Considering all permutations of these measures, across applicable customer sectors, market segments, fuels, and end uses, resulted in customized data, compiled and analyzed for over 10,000 measures. Appendix D describes all measures analyzed, and Appendix E provides technical details and the economic potential for all the permutations.

The remainder of this section presents:

- A summary of resource potentials by fuel; and
- Detailed sector-level results.

Summary of Results

Electric Energy Efficiency Potential

Table 26 and Table 27 show forecasted 2033 baseline electric sales and potential, by utility and sector, respectively.

⁸ Cadmus did not model manufactured homes for LG&E's service territory due to the small number of manufactured homes in Louisville.



Table 26. Technical and Economic Electric Energy-Efficiency Potential (Cumulative 2033) by Utility

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
LG&E	10,866,812	2,217,527	20%	328	1,028,674	9%	169
KU	13,349,031	3,173,125	24%	398	1,498,456	11%	216
Total	24,215,844	5,390,653	22%	726	2,527,130	10%	384

Table 27. Technical and Economic Electric Energy-Efficiency Potential (Cumulative 2033) by Sector

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
Residential	14,225,644	3,689,033	26%	313	1,716,264	12%	147
Commercial	9,990,199	1,701,619	17%	413	810,866	8%	238
Total	24,215,844	5,390,653	22%	726	2,527,130	10%	384

Study results indicate 5,390 GWh of technically feasible electric energy-efficiency potential by 2033, the end of the 20-year planning horizon, with approximately 2,527 GWh of these resources proving cost-effective. Identified economic potential amounts to 10% of forecast load in 2033.

Cadmus based savings on forecasts of future consumption, without consideration of expected savings from the Company's program savings. While consumption forecasts accounted for past savings each utility has acquired, estimated potential was inclusive of—not in addition to—current or forecasted program savings.

Cadmus calculated demand savings in the tables above using the Company's hourly end use-specific load shapes. We identified the Company's summer coincident peak hour and multiplied annual energy savings by the peak hour coincidence factor to determine demand savings for each measure.

As shown in Table 26 (above), utility-specific technical and economic potential, through a function of baseline sales, can be roughly compared when analyzed in percentage terms. Differences in customer distributions by segment and in other utility-specific customer characteristics drove differences in technical potential as a percent of baseline sales.

Table 27 (above) provides each sector's technical and economic potentials. The residential sector offers the largest portion of technical and economic potential, at 68%. The commercial sector accounts for the remaining 32% of technical and economic potentials.

Natural Gas Energy Efficiency Potential

Table 28 presents 2033 forecasted baseline sales and potential by sector. Study results indicate over 96 million therms of technically feasible, natural gas energy-efficiency potential by 2033. The identified economic potential of 47 million therms amounts to 16% of forecast load in 2033.

Table 28. Technical and Economic Natural Gas Energy-Efficiency Potential (Cumulative 2033) by Sector

Utility	Base Case Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Residential	186,454	66,230	36%	34,523	19%
Commercial	102,299	30,069	29%	12,626	12%
Total	288,753	96,299	33%	47,149	16%

The residential sector accounts for 68% of the total technical and 73% of the total economic potential. The commercial sector accounts for the remaining 32% and 27% of technical and economic potential, respectively.

Detailed Energy-Efficiency Potentials

Residential Sector—Electric

Study results indicate residential customers account for about 58% of forecasted electricity retail sales. The single-family, manufactured, and multifamily potential savings sources include:

- Equipment efficiency upgrades (e.g., air conditioning, refrigerators);
- Improvements to building shells (e.g., insulation, windows, air sealing); and
- Increases in lighting efficiency (e.g., CFLs, LED interior lighting).

Table 29 shows, based on resources included in this assessment, estimated residential sector electric economic potential of 1,716 GWh over 20 years, corresponding to a 12% reduction (10% for LG&E and 13% for KU) in 2033 residential consumption.

Table 29. Residential Sector Electric Energy-Efficiency Potential by Utility (Cumulative 2033)

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
LGE	6,032,470	1,383,734	23%	126	627,913	10%	56
KU	8,193,174	2,305,299	28%	188	1,088,351	13%	91
Total	14,225,644	3,689,033	26%	313	1,716,264	12%	147

As shown in Figure 8, single-family homes represent 88% of total economic potential in the residential sector, followed by multifamily and manufactured homes. Each home type's proportion of baseline sales served as the primary drivers, but other factors, such as heating fuel sources, played important roles in determining potential.

For example, manufactured homes typically exhibit higher electric heating saturations than other home types, increasing their relative shares of the potential. Conversely, lower-use per customer for multifamily units decreases this potential, as some measures may not be cost-effective at lower consumption levels.



Figure 8. Residential Sector Electric Economic Potential by Segment

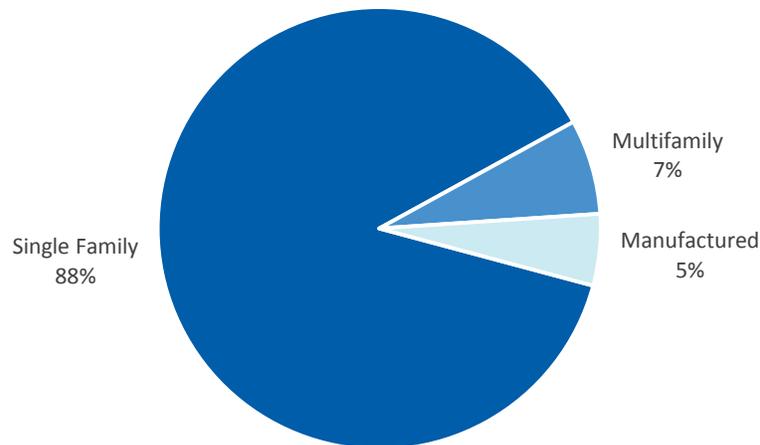
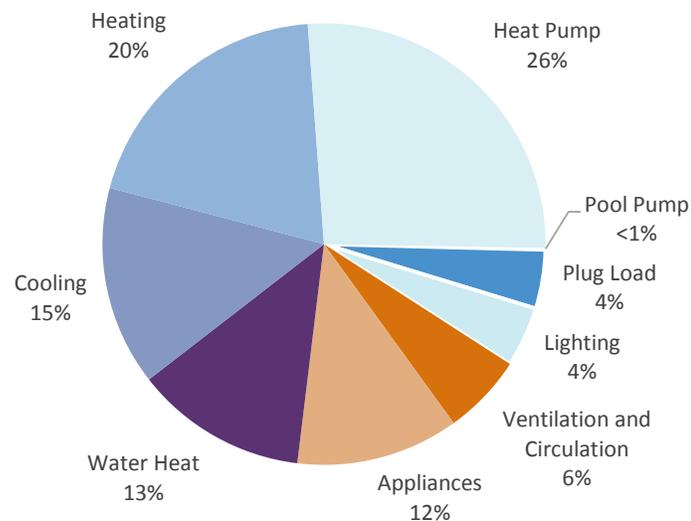


Figure 9 presents the distribution of electric economic potential by measure type.

Figure 9. Residential Sector Electric Economic Potential by Measure Type



As shown, the largest portion of economic potential in the residential sector (26%) results from heat pump savings, achieved through shell measures and upgrades to efficient equipment. Heating measures, insulation, and infiltration reduction account for the next largest slice (20%), followed by various cooling, appliances, and water heating end uses. Plug load end uses account for a small portion of economic potential due to high current market saturations of efficient equipment. Table 30 presents technical and economic potentials by end-use category. Base case sales presented in the table below reflect the end

use forecast Cadmus developed for the purpose of modeling energy-efficiency potential, not the Company's load forecast.

Table 30. Residential Sector Electric Energy-Efficiency Potential by End-Use Category (Cumulative 2033)

Measure Type	End Use	Base Case Sales (MWh)	Technical Potential		Economic Potential	
			MWh	% of Base Sales	MWh	% of Base Sales
Appliances	Cooking Oven	72,292	1,169	2%	0	0%
	Dryer	541,145	7,315	1%	0	0%
	Freezer	130,394	56,814	44%	56,814	44%
	Refrigerator	563,826	186,048	33%	144,560	26%
Cooling	Cool Central	1,817,288	767,914.5	42%	247,682	14%
	Cool Room	57,158	23,590	41%	0	0%
Heat Pump	Heat Pump	2,062,997	786,366	38%	469,400	23%
Heating	Heat Central	1,180,957	622,568	53%	333,742	28%
	Heat Room	75,500	26,536	35%	681	1%
Lighting	Lighting Interior Specialty	179,046	147,149	82%	74,912	42%
	Lighting Standard	418,036	128,548	31%	0	0%
Plug Load	Computer	276,776	19,494	7%	0	0%
	Copier	13,568	332	2%	332	2%
	Dehumidifier	159,180	12,193	8%	0	0%
	DVD	22,403	1,850	8%	0	0%
	Home Audio System	102,775	9,343	9%	0	0%
	Monitor	46,802	1,283	3%	1,283	3%
	Multifunction Device	127,473	6,257	5%	6,257	5%
	Plug Load Other	548,401	6,264	1%	0	0%
	Set Top Box	325,474	65,111	20%	65,111	20%
	TV	424,516	10,564	2%	0	0%
Pool Pump	Pool Pump	69,885	51,260	73%	2,261	3%
Ventilation and Circulation	Ventilation and Circulation	473,631	125,795	27%	100,161	21%
Water Heat	Water Heat GT 55 Gal	471,652	239,056	51%	76,713	16%
	Water Heat LE 55 Gal	887,758	386,215	44%	136,355	15%

Residential Sector – Natural Gas

As shown in Table 30, single-family homes represent 93% of total economic residential potential, followed by multifamily homes. Multifamily homes represent a smaller share of natural gas potential due to a lower saturation of gas furnaces (Figure 10).



Figure 10. Residential Sector Natural Gas Economic Potential by Segment (Cumulative 2033)

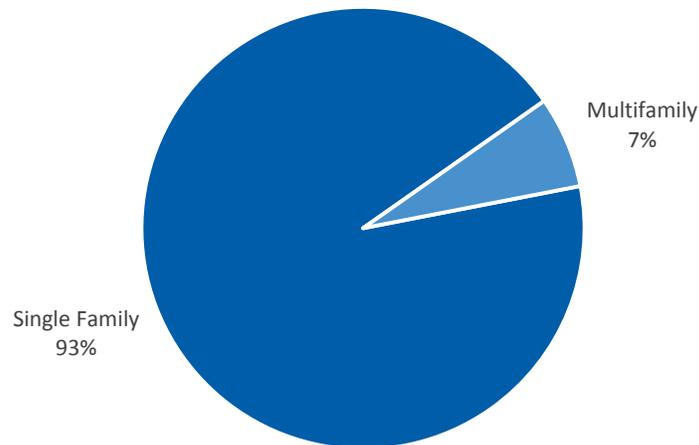


Figure 11 presents distributions of natural gas economic potential by measure type. The largest portion of economic potential in the residential sector (87%) derives from measures impacting heating end uses, followed by water heating (13%).

Figure 11. Residential Sector Natural Gas Economic Potential by Measure Type (Cumulative 2033)

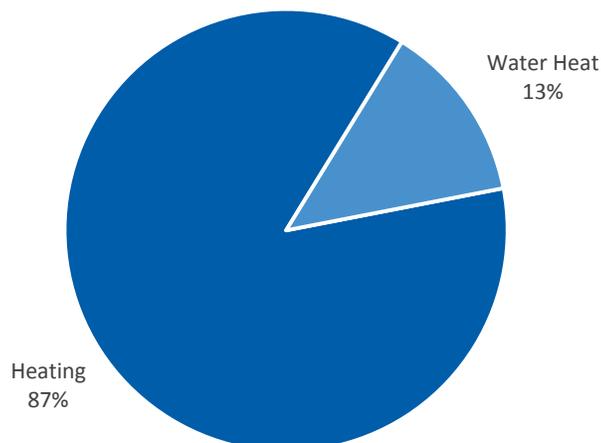


Table 31 provides technical and economic potential by end-use category. As shown, central gas furnaces offer significant technical potential of 46% and 25% of natural gas use that may be captured economically in this end use. Combined water heating measures show an economic potential equivalent to nearly 30% of the end use.

Table 31. Residential Sector Natural Gas Energy-Efficiency Potential by End-Use Category (Cumulative 2033)

End Use	Base Case Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Cooking Oven	544	500	92%	0	0%
Dryer	403	52	13%	0	0%
Water Heat GT 55 Gal	12,151	3,289	27%	1,551	13%
Water Heat LE 55 Gal	21,380	8,039	38%	2,999	14%
Heat Central Furnace	118,508	54,070	46%	29,973	25%
Pool Heat	1,546	280	18%	0	0%

Commercial Sector – Electric

Table 32 shows, based on resources included in this assessment, estimated electric economic potential in the commercial sector at slightly more than 810 GWh over the 20-year planning horizon. This corresponds to an 8% reduction (8% for LG&E and 8% for KU) of forecasted 2033 commercial consumption. Cost-effective energy-efficiency measures equate to a 238 MW peak demand reduction in 2033.

Table 32. Commercial Sector Electric Energy-Efficiency Potential by Utility

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
LG&E	4,834,342	833,793	17%	202	400,761	8%	113
KU	8,193,174	867,826	17%	210	410,104	8%	125
Total	14,225,644	1,701,619	17%	413	810,866	8%	238

As shown in Figure 12, large retail and miscellaneous buildings represent the largest shares (25% and 15%, respectively) of economic potential in the commercial sector. The miscellaneous segment combines: customers not fitting into the other categories; and those that would fit, but had insufficient information to be classified. The commercial sector also provides considerable savings opportunities in: large and small offices (11% each), retail (11%), and grocery (10%) segments. Moderate savings can be expected in education, health, restaurants, and lodging facilities.



Figure 12. Commercial Sector Electric Economic Potential by Segment (Cumulative 2033)

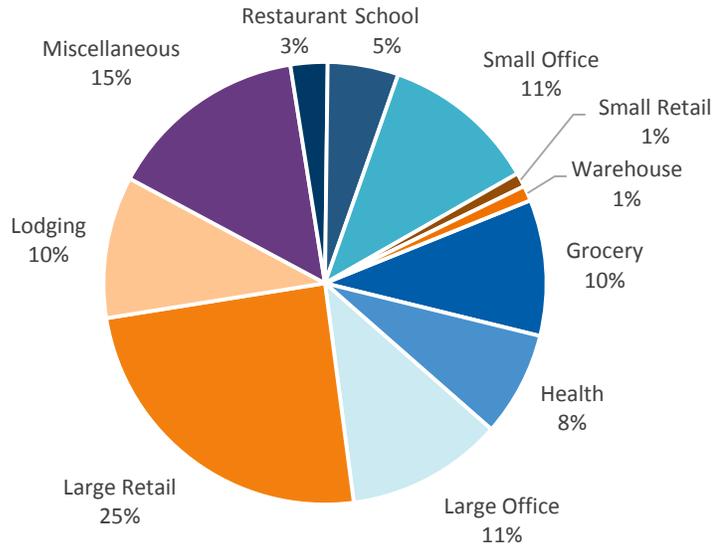


Figure 13 presents distributions of commercial sector electric economic potential by measure type. The largest portion of economic potential in the commercial sector (29%) derives from cooling measures, followed by lighting (24%). Ventilation and circulation (motors) account for 15% of economic potential. Table 33 provides technical and economic potential by end use.

Figure 13. Commercial Sector Electric Economic Potential by Measure Type (Cumulative 2033)

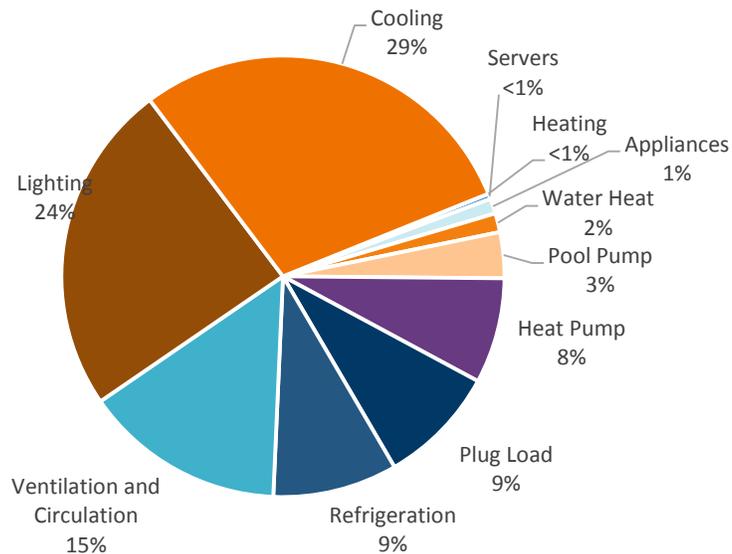


Table 33. Commercial Sector Electric Energy-Efficiency Potential by End-Use Category

Measure Type	End Use	Base Case Sales (MWh)	Technical Potential		Economic Potential	
			MWh	% of Base Sales	MWh	% of Base Sales
Appliances	Cooking	37,830	4,740	13%	262	1%
	Freezers	3,872	719	19%	719	19%
	Refrigerators	37,173	10,112	27%	7,957	21%
Cooling	Cooling Chillers	85,333	30,747	36%	13,838	16%
	Cooling Dx Evap	1,071,117	344,481	32%	221,630	21%
	Package Terminal AC	12,857	1,897	15%	495	4%
	Room Cool	12,007	1,065	9%	449	4%
Heat Pump	Heat Pump	290,369	78,116	27%	47,328	16%
	Package Terminal HP	110,506	22,385	20%	15,381	14%
Heating	Room Heat	8,375	927	11%	45	1%
	Space Heat	125,030	32,234	26%	136	0%
Lighting	Lighting Exterior	818,865	244,783	30%	30,447	4%
	Lighting Interior Fluorescent	2,588,902	253,268	10%	59,331	2%
	Lighting Interior Hid	527,861	48,494	9%	3,303	1%
	Lighting Interior Other	433,019	77,750	18%	16,427	4%
	Lighting Interior Screw Base	430,220	91,706	21%	87,705	20%
Plug Load	Computers	164,272	50,657	31%	50,103	30%
	Fax	5,091	1,738	34%	1,738	34%
	Flat Screen Monitors	34,601	183	1%	0	0%
	Other Plug Load	502,629	20,441	4%	4,000	1%
	Photo Copiers	8,442	60	1%	0	0%
	Printers	25,828	126	0%	126	0%
	Vending Machines	118,148	14,782	13%	14,782	13%
Pool Pump	Pool Pump	74,598	27,251	37%	27,251	37%
Refrigeration	Refrigeration	1,017,361	135,269	13%	73,744	7%
Servers	Servers	23,630	3,677	16%	3,107	13%
Ventilation and Circulation	Ventilation And Circulation	1,295,829	160,140	12%	119,317	9%
Water Heat	Water Heat Gt 55 Gal	30,206	8,339	28%	3,155	10%
	Water Heat Le 55 Gal	96,228	35,529	37%	8,090	8%

Commercial Sector—Natural Gas

As shown in Table 34, miscellaneous buildings and health facilities represent the largest shares of economic potential in the commercial sector (32% and 19%, respectively). As with the commercial electric sector, the miscellaneous segment includes: a combination of customers not fitting into the other categories, and those that would fit but presented insufficient information to be classified. Considerable savings opportunities can be expected in the commercial sector's retail (17%), office (7%),

and lodging (13%) segments. Moderate savings amounts can be expected in restaurants and grocery facilities (Figure 14).

Figure 14. Commercial Sector Natural Gas Energy-Efficiency Economic Potential by Segment (Cumulative 2033)

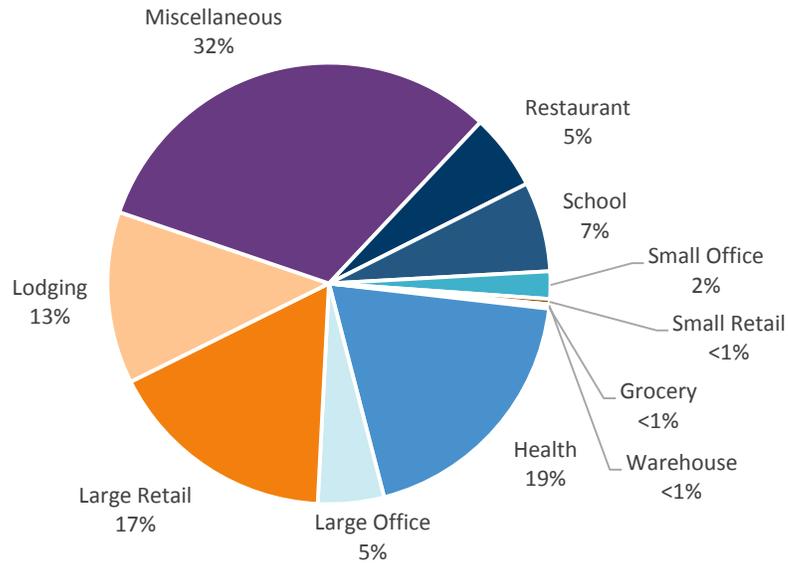


Figure 15 presents distributions of natural gas energy-efficiency economic potential by measure type. The largest portion of economic potential in the commercial sector (60%) comes from the furnace end use, followed by water heating (20%). Boilers account for 10% of economic potential, with pool heat and appliances accounting respectively for 7% and 2% of the remaining potential (as shown in Table 34).

Figure 15. Commercial Sector Natural Gas Energy-Efficiency Economic Potential by Measure Type (Cumulative 2033)

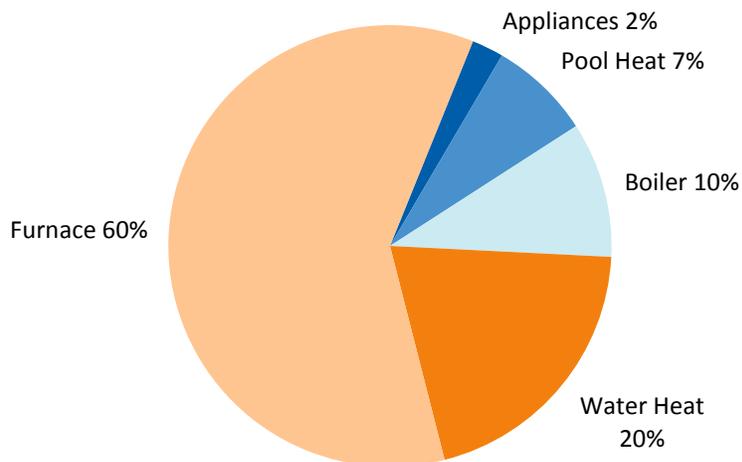


Table 34. Commercial Sector Gas Energy-Efficiency Potential by End Use (Cumulative 2033)

End Use	Baseline Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Cooking	7,934	856	11%	293	4%
Space Heat Boiler	11,622	4,973	43%	1,253	11%
Space Heat Furnace	56,136	18,595	33%	7,585	14%
Water Heat Gt 55 Gal	5,154	1,671	32%	435	8%
Water Heat Le 55 Gal	8,481	3,006	35%	2,121	25%
Pool Heat	12,972	968	7%	939	7%



Achievable Potential

This study defines “achievable” potential as the portion of economic potential that can be targeted and acquired through energy-efficiency programs offered by the Company. Therefore, Cadmus measures and expresses achievable potential as a fraction (percent) of economic potential. While estimating technical and economic potentials remain fundamentally engineering and accounting endeavors, based on industry-standard practices and methodologies, achievable potential is more difficult to quantify and reliably predict as it depends on a large number of behavioral factors, which tend to change unpredictably over time.

A number of factors account for the gap between economic and achievable potential, including: customer awareness; perceptions of energy efficiency’s value; and energy-efficiency measures’ upfront costs. In the case of new measures and programs, there are additional practical constraints regarding availability of delivery infrastructure. These barriers have been well documented in energy-efficiency literature.⁹

The utility can mitigate some of these market barriers through program design and delivery processes, while others remain out of a utility’s reach. For example, a utility can reduce first-cost barriers by providing financial incentives to lower up-front costs and improve customer paybacks. However, since utility incentives only cover a portion of the incremental costs for most measures, incentives may not be sufficient to motivate a customer to adopt energy-efficiency measures. This particularly holds true for the commercial sector and large equipment in the residential sector, where up-front costs tend to be high. Thus, the task becomes one of assessing which barriers the Company can overcome over the course of the planning horizon, and how much economic potential can be deemed reasonably achievable.

To assess the fraction of customers who would likely adopt an energy-efficiency measure, the telephone surveys included a battery of questions to elicit information about customers’ willingness to adopt measures under different *hypothetical* incentive scenarios. For a number of measure types (e.g., heating, cooling, lighting, weatherization), survey respondents were first asked if they would adopt efficient measures if the Company did not provide an incentive—corresponding to the low-achievable scenario. The Cadmus team then asked if the customer would adopt the efficient measure if the Company covered 50% of the measure’s incremental cost (the cost to upgrade) —corresponding to the medium-achievable scenario. Finally, the surveys asked if a customer would adopt the efficient measure if the Company covered 75% of the measure’s incremental cost—corresponding to the high-achievable scenario. Figure 16 and Figure 17 show residential and commercial customers’ willingness-to-adopt efficient measures under the different incentive scenarios.

⁹ See for example William H. Golove and Joseph H. Eto, “Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency,” LBL-38059 UC-1322, March 1996.

Figure 16. Residential Willingness-To-Adopt by Measure Type

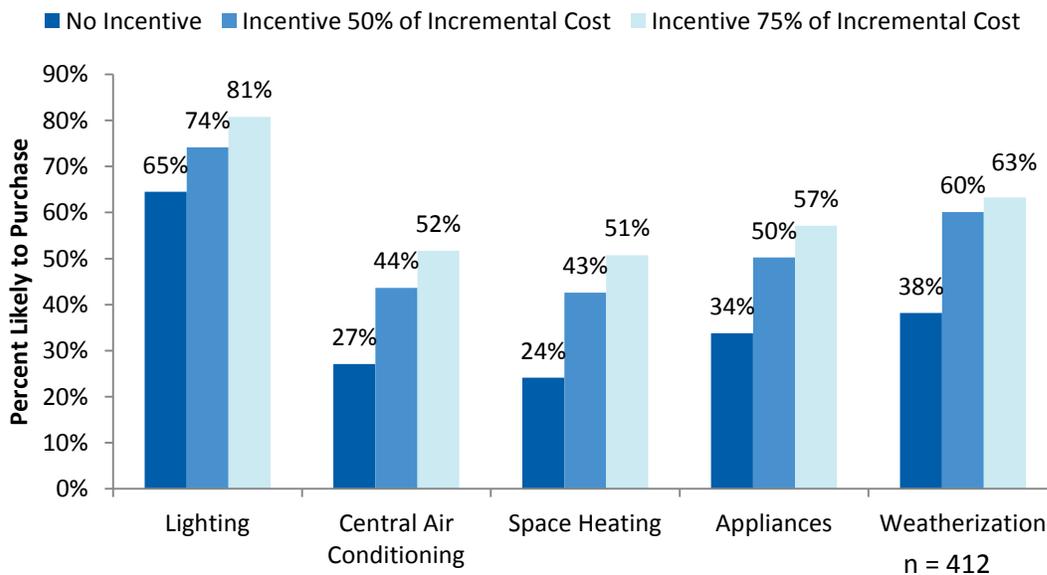
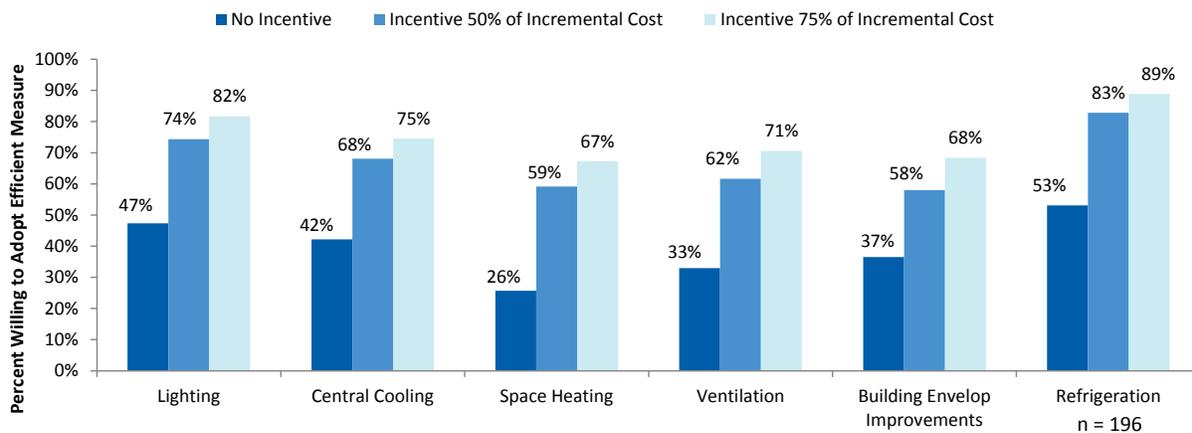


Figure 17. Commercial Willingness-To-Adopt by Measure Type



The Company's incentives cannot exceed their avoided cost of capacity. Cadmus determined the maximum incentive for each measure, based on the measure's demand savings and the Company's avoided costs. Cadmus then calculated the maximum one-time incentive (capped at \$100/kW-year) that the Company could offer, and determined the corresponding percent of customers likely to adopt the measure under this "maximum incentive scenario."

The analysis of the incremental cost of measures included in this assessment indicates, for most measures, the maximum incentive of \$100/kW-year translates to incentive amounts covering less than 50% of the measures' incremental cost. Thus, the maximum amount of achievable potential is expected



to be limited to the fraction of customers likely to adopt the measure at a 50% incentive.¹⁰ Figure 18 shows the weighted average, maximum, achievable potential for each measure group, corresponding with the maximum incentive. Table 35 summarizes electric achievable energy potential under low, medium, and high scenarios. Table 36 shows achievable demand savings (MW) in 2033.

Figure 18. Commercial Willingness-to-Adopt with Max (\$100/kW-year) Incentive

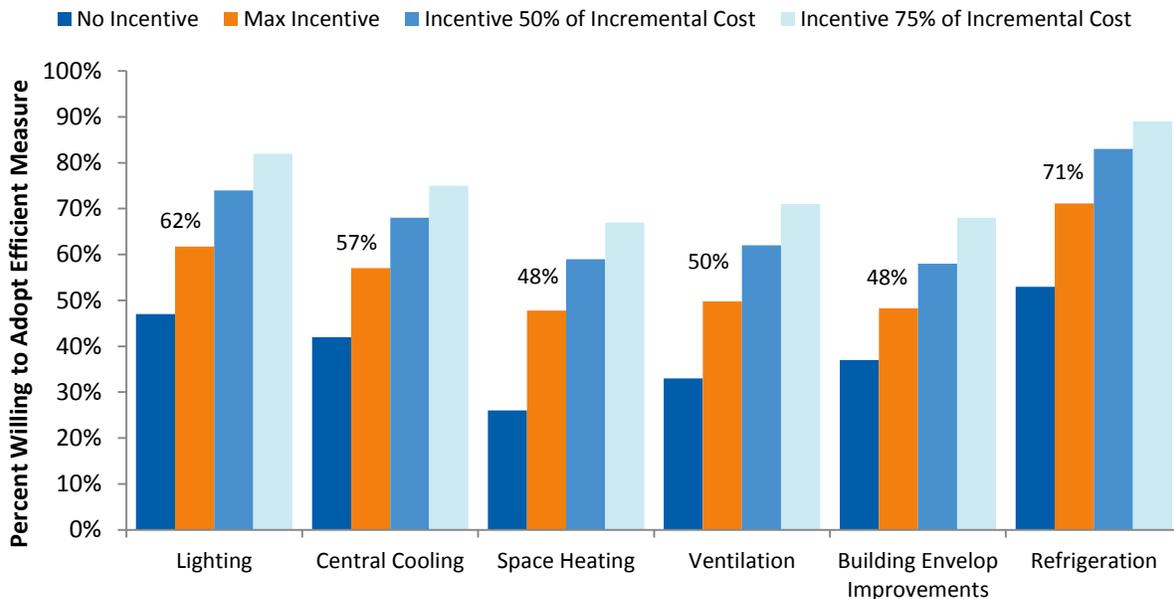


Table 35. Electric Achievable Energy Potential by Sector (Cumulative 2033)

Sector	Base Case Sales (MWh)	Low Achievable		Medium Achievable		High Achievable	
		MWh	% of Base Sales	MWh	% of Base Sales	MWh	% of Base Sales
Residential	14,225,644	602,136	4.2%	920,185	6.5%	1,005,172	7.1%
Commercial	9,990,199	339,437	3.4%	461,670	4.6%	473,173	4.7%
Total	24,215,844	941,572	3.9%	1,381,855	5.7%	1,478,345	6.1%

Table 36. Electric Achievable Demand Potential by Sector (In 2033)

Sector	Low Achievable - MW	Medium Achievable - MW	High Achievable - MW
Residential	51	78	86
Commercial	97	133	139
Total	148	211	225

¹⁰ While the average maximum incentive for each measure group is less than 50% of the incremental cost, the maximum incentive exceeds 50% of the incremental cost for a handful of measures. For these measures, high achievability is greater than medium achievability.

Estimation of achievable potential for natural gas followed the same approach with two exceptions:

1. Unlike electric programs, where incentives are constrained by the Company's avoided capacity cost, cost-effectiveness for gas programs are determined on the basis of natural gas commodity costs. This means the high scenario reflects incentives that may cover up to 75% of a measure's incremental cost.
2. Natural gas measures are limited to a few end uses, namely space heating, water heating, and building envelope improvements. These measures generally have higher up-front costs than most electric measure. Most natural gas measures consist of equipment that generally tends to be replaced only upon burnout. Therefore, achievable potential for natural gas is expected to be lower than for electric measures.

Analysis results show similar levels of achievable natural gas efficiency potential in the residential and commercial sectors, representing about 8% to 9% of sales, as shown in Table 37.

Table 37. Gas Achievable Potential by Sector (Cumulative 2033)

Sector	Base Case Sales (Thousand Therms)	Low Achievable		Medium Achievable		High Achievable	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Residential	186,454	10,052	5%	16,695	9%	17,449	9%
Commercial	102,299	4,659	5%	7,603	7%	8,564	8%
Total	288,753	14,711	5%	24,298	8%	26,013	9%

The results also show that, assuming incentives covering 50% of incremental measure costs, savings equal to approximately 8% of sales might be achieved in the residential and commercial sectors, combined. Moreover, higher incentives covering up to 75% of incremental measure costs can be expected to only marginally increase achievable potential.

Types of Energy-Efficiency Potential

Energy-efficiency measures generally fall into one of two discretionary (retrofit) or non-discretionary (lost opportunity) groups. Discretionary measures (e.g. lighting upgrades in the commercial sector) may be implemented immediately, financial and practical considerations notwithstanding. Non-discretionary measures include measures that are typically implemented only on burnout of the existing equipment (normal turn-over) and new construction. The key difference between the two measures types is that unlike retrofit measures, the availability of lost-opportunity resources is determined by market forces that are outside the program administrator's control.

As shown in Table 38, over three-quarters (1,060 GWh) of the estimated medium-case achievable electric efficiency programs of 1,382 GWh is expected to consist of discretionary measures. For natural gas, the discretionary potential is 19,544 and the lost opportunity is 4,753 therms out of the total 24,298 through 2033.

For natural gas, of the nearly 24.3 million therms of medium-case achievable potential, 19.5 million therms are discretionary and about 4.8 million therms are lost-opportunity.

Table 38. Cumulative Electric and Natural Medium-Case Achievable Potential by Type (in 2033)

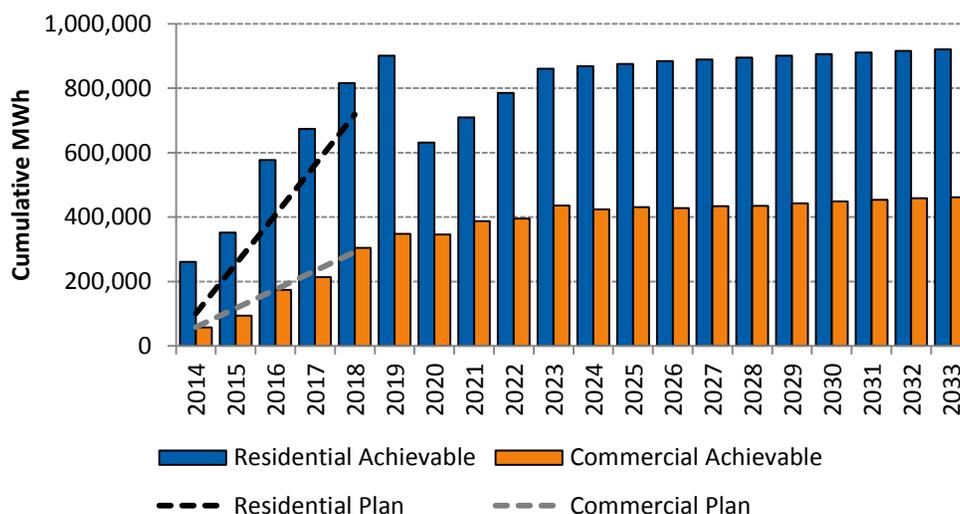
Measure Type	Electric Energy (MWh)	Electric Demand (MW)	Natural Gas (1000 Therms)
Discretionary	1,060,217	160	19,544
Lost Opportunity	321,638	51	4,753
Total	1,381,855	211	24,298

Planning Implications

For electricity, the cumulative achievable energy potential has been shown to be 1,060 GWh for the 20 year study period; where 67% is residential for 706 GWh and 33% is commercial for 354 GWh. This translates into a levelized annual savings of roughly 35,000 MWh in the residential and less than 18,000 MWh per year in the commercial sector, for a total of 53,000 MWh per year over the 20-year planning horizon on average.

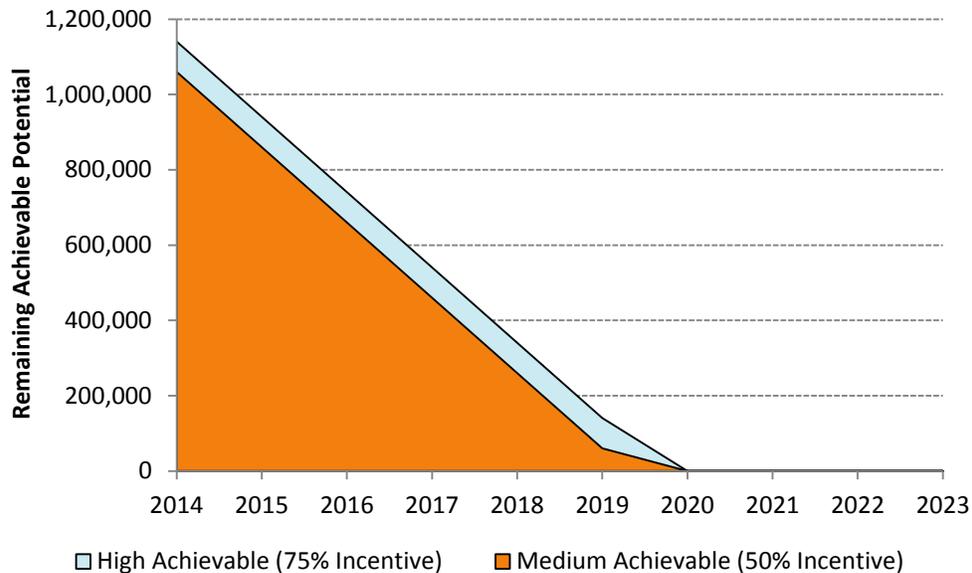
The Company's 2012-2018 demand-side management plan currently targets average annual electricity savings of 140,000 MWh for the residential and 60,000 MWh for the commercial sector. Maintaining existing targets would mean the Company would exhaust achievable electric efficiency potential in less than six years. Even under this accelerated acquisition, commercial achievable potential through 2018 is less than planned savings, as shown in Figure 19. Residential electric efficiency targets are less than cumulative achievable potential in the first five years of the study; however, it will be difficult for the company to sustain these targets in the long-run.

Figure 19. Comparison of Annualized Medium-Case Achievable Potential and 2012-2018 Annual Targets



Compared to the estimated annual potential, the Company's targets are well above the 53,000 MWh estimated annual potential from the residential and commercial sector. As Figure 20 illustrates, the results of this study indicate that the Company's planned acquisition rate of 200,000 MWh per year would deplete the medium-case achievable discretionary potential of 1,060,000 MWh in a little more than 5 years, starting in 2015.

Figure 20. Remaining Medium Case Achievable Discretionary Electric Energy-Efficiency Potential



Unlike electric energy-efficiency, eighty percent of gas energy-efficiency potential comes from retrofit measures. This means savings is less dependent on new construction rates and the natural turnover of equipment. Therefore, the Company has relatively more control over the timing of natural gas savings.

While this study indicates that the Company will exhaust the discretionary residential and commercial electric energy-efficiency potential in less than six years, small amounts of non-discretionary savings from new construction and replacement of existing equipment upon burnout will remain. While Cadmus only considered current equipment costs and existing technologies, potential declines in the cost of energy-efficient existing energy-efficiency technologies and emergence of new technologies could provide additional opportunities for further savings.



In Collaboration with: EHI Consultants

Energy Efficiency Potential Study: Volume II

December 2013

Louisville Gas and Electric Company and Kentucky Utilities Company
220 West Main Street
Louisville, Kentucky 40202

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CADMUS

Prepared by:
Cadmus
EHI, Inc.

Cadmus: Energy Services Division

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Appendix A. Data Collection Instruments

LG&E/KU Residential Survey

Objectives and Approach

To inform the energy-efficiency potential study and future program design, Cadmus will conduct telephone surveys with 400 residential Louisville Gas & Electric and Kentucky Utilities customers. Cadmus will use the surveys to assess general attitudes toward energy efficiency and to gather information on program awareness, perceptions, and important factors that affect energy-efficiency decision making. The surveys will also be used to gather data to supplement existing saturation data and collect general demographic information. The survey is designed to explore the research topics presented in Table 1.

Table 1. Residential Research Topics

Key Areas of Investigation	Research Topic	Survey Questions
Assess awareness, perceptions, actions related to energy efficiency	• Awareness and knowledge of energy efficiency/saving energy	4, 5, 6
	• Concern and personal responsibility for saving energy	7
	• Actions taken to save energy	14, 15, 16, 17
	• Motivations to save energy	8, 18
	• Barriers to saving energy	13
Assess efficiency program awareness and perceptions	• Awareness of energy-efficiency programs	6
	• Previous participation in energy-efficiency programs	9
	• Information sources for program information	12
Assess key factors affecting program participation	• Major factors influencing participation in energy-efficiency program, including rebates	10, 19
	• If aware but not participating: major factors influencing decision not to participate	11
	• Willingness to participate in programs	19
Gather supplemental saturation data	• Recent equipment purchases	20b, 21b, 22b
	• Heating system and fuel type	20, 20a
	• Cooling system type	21, 21a
	• Water heating system type	22, 22a
	• Consumer electronics	23, 24, 25
	• Data on "high efficiency" equipment for CAC, heat pump, storage tank water heat	20a, 20b, 21a, 21b, 22a, 22b
Gather customer demographic and household information	<ul style="list-style-type: none"> • Building type • Own or rent home • Age of home • Size of home (including # of stories) • Number of people living in household • Age of respondent • Internet access at home 	3, 26, 27, 28, 29, 30, 31, 32

Key

[RED TEXT] – Instructions for programmer

[GREEN TEXT] – Instructions for interviewer

[BLUE TEXT] – Data to be pulled from sample

Introduction and Screening

Hello, may I speak with [CONTACT NAME]? My name is [INTERVIEWER NAME] and I'm calling from EHI on behalf of [LG&E or KU]. We would like you to take part in an important study to better understand how Kentucky residents use energy at home. Your participation in this study will help [LG&E or KU] design programs to save you energy and money. This is not a sales call and your answers are confidential.

[IF RESPONDENT ASKS "HOW LONG": This survey should take about 10-12 minutes.]

1. Are you a person in your household who would be very likely to be involved in making decisions about how you use energy at home, such as buying appliances, heating equipment, or making your home more energy efficient? [ELECTRIC AND GAS / ELECTRIC / GAS]
 1. Yes [CONTINUE]
 2. No [ASK IF YOU CAN SPEAK TO THE PERSON WHO WOULD BE INVOLVED. IF AVAILABLE, REPEAT INTRODUCTION AND CONTINUE. IF NOT AVAILABLE, SCHEDULE BETTER TIME TO CALL BACK.]
 98. Don't know [ASK IF YOU CAN SPEAK TO THE PERSON WHO WOULD BE INVOLVED. IF AVAILABLE, REPEAT INTRODUCTION AND CONTINUE. IF NOT AVAILABLE, SCHEDULE BETTER TIME TO CALL BACK.]
 99. Refused [THANK AND TERMINATE]

2. Can you verify that [LG&E or KU] currently provides your [ELECTRIC AND GAS / ELECTRIC / GAS] service?
 1. Yes
 2. No
 98. Don't know
 99. Refused

3. Which of the following best describes your home? [IF QUOTA FOR HOUSING TYPE REACHED, READ: We have already reached our quota for [SINGLE FAMILY / MULTIFAMILY / MOBILE] homes. Thank you for your time.]
 1. Single-family home (SF)
 2. Apartment or townhome (MF)
 3. Condominium (MF)
 4. Duplex (MF)
 5. Mobile home (MH/MAN)
 98. Don't know
 99. Refused

Awareness and Knowledge

First, I'd like to ask you some general questions about energy efficiency. There are no right or wrong answers to any of the questions in this survey, so please just give me your best response.

[THROUGHOUT THE SURVEY, MAKE SURE RESPONDENTS HERE ARE FOCUSING ON ENERGY—THAT IS, ELECTRIC AND NATURAL GAS USAGE, NOT WATER. PLEASE DIRECT THEM BACK TO ENERGY USAGE IF THEY START TALKING ABOUT WATER USAGE.]

4. First, how knowledgeable are you with all the ways that you can save energy in your home? Would you say you are...?
 1. Very knowledgeable
 2. Somewhat knowledgeable
 3. Not too knowledgeable
 4. Not at all knowledgeable
 98. Don't know
 99. Refused

5. Are you aware of any governmental agencies or electric or gas utilities that sponsor programs or give rebates, tax credits, or discounts on services to help you save energy at home?
 1. Yes
 2. No [SKIP TO Q7]
 98. Don't know [SKIP TO Q7]
 99. Refused [SKIP TO Q7]

6. For each of the following energy-efficiency programs, please tell me if you had heard of it before my call today. [RANDOMIZE LIST] [1 = Yes, 2 = No, 98 = Don't know, 99 = Refused]
 - a. Home Performance with Energy Star or KY Home Performance
 - b. Energy-Saving New Homes Program (or ENERGY STAR New Homes Program)
 - c. A/C Testing and Tune-up Program
 - d. Fridge and Freezer Recycling Program
 - e. Home Energy Analysis Program
 - f. Home Energy Rebates Program [DO NOT READ, FOR INTERVIEWER'S REFERENCE: ENERGY STAR appliances, HVAC equipment, window film]
 - g. High Efficiency Lighting Program
 - h. Demand Conservation Program (or Demand Response Program)

- i. WeCare Program

Concern and Personal Responsibility

7. Now, I'd like you to tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each of the following statements. [RANDOMIZE] [1 = Strongly agree, 2 = Somewhat agree, 3 = Somewhat disagree, 4 = Strongly disagree, 98 = Don't know, 99 = Refused]
- a. I worry I won't be able to afford my energy bills.
 - b. I worry that the cost of energy for my home will go up.
 - c. I am concerned that how I use energy at home affects the environment.
 - d. Saving energy is a high priority in our home.
 - e. I worry how my household's use of energy affects climate change.
 - f. I feel it is my responsibility to use as little energy as I can to protect the environment.
 - g. I intend to take steps to cut my energy bills at home during the next three months.

Motivations to Save Energy

[ASK IF Q7d = 1, 2, OR 3]

8. Please rate how important each of the following reasons are for you to save energy at home. Tell me if each reason to save energy is very important, somewhat important, not too important, or not at all important to you. [RANDOMIZE] [1 = Very important, 2 = Somewhat important, 3 = Not too important, 4 = Not at all important, 98 = Don't know, 99 = Refused]
- a. To save money on your energy bills.
 - b. To be more green or to do your part to help the environment.
 - c. To make sure future generations have enough energy.
 - d. To reduce our dependence on foreign oil.
 - e. To not waste.
 - f. To make your energy bills more predictable.
 - g. To improve the comfort or health of your home.

Efficiency Program Awareness and Experience**[SKIP IF Q5 = 2]**

9. Have you ever received a rebate, tax credit, or discount on services from a utility or government energy-efficiency program?
1. Yes
 2. No
 98. Don't know
 99. Refused

[ASK IF Q9 = 1]

10. What are the most important reasons you decided to participate in the utility or government energy-efficiency program? **[DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]**

1. To learn how my home uses energy
2. To save energy
3. To save money on utility bills
4. To obtain a rebate or program incentive
5. To replace old equipment
6. To replace broken equipment
7. To get more efficient equipment
8. To acquire the latest technology
9. To reduce maintenance costs
10. To increase comfort in the home
11. Previous experience with other utility programs
12. To help protect the environment
13. Recommended by contractors/trade allies
14. Recommended by family, friend, co-worker or neighbor
15. Part of a broader remodeling or renovation
16. Program was sponsored by [LG&E or KU]
97. Other [SPECIFY: _____]
98. Don't know
99. Refused

[ASK IF Q5 = 1 AND Q9 = 2]

11. What are the most important reasons you have not participated in these types of programs? **[DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]**

1. Nothing left to do/home is already efficient
2. Can't afford it/too expensive
3. Inconvenient, don't have the time, too busy
4. Don't know what to do/don't have the right information
5. Home has challenges in its construction or age

6. Too hard to install/implement
 7. Not confident I'll save energy/it will be worth it
 8. Afraid it will make us uncomfortable
 9. Challenges with contractors
 10. Saving energy is not that important
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused
12. What is the best way to inform customers like you about programs to help you save energy at home? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]
1. Bill insert from utility
 2. TV or radio advertisement by utility/efficiency program
 3. Newspaper advertisement by utility/efficiency program
 4. Phone call from utility staff
 5. Local organization
 6. Event
 7. Word of mouth (friend, family member, neighbor, or co-worker)
 8. Internet/Website
 9. Advertising by a participating auditor/contractor
 10. Direct contact with a participating auditor/contractor
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused

Barriers

[ASK IF Q7d = 1, 2, OR 3]

13. What obstacles, if any, do you face in trying to save energy in your home? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]
1. Nothing left to do/home is already efficient
 2. Can't afford it/too expensive
 3. Inconvenient, don't have the time, too busy
 4. Don't know what to do/don't have enough information
 5. Home has challenges in its construction or age
 6. Too hard to install/implement
 7. Not confident I'll save energy/it will be worth it
 8. Afraid it will make us uncomfortable
 9. Challenges with contractors
 10. Saving energy is not that important/don't face any obstacles
 97. Other [SPECIFY: _____]
 98. Don't know

99. Refused

Energy Behaviors

Next, I have more specific questions about how you use energy in your home.

14. Can you please tell me which of the following things related to how your home uses energy you have done in the past year? [RANDOMIZE LIST] [1 = Yes, 2 = No, 98 = Don't know, 99 = Refused]

- a. Replaced light bulbs with Compact Fluorescent Light (or CFL) bulbs – these bulbs often have a spiral or swirly shape
- b. Replaced light bulbs with LED bulbs
- c. Increased the levels of insulation in your home, such as in the attic and walls
- d. Reduced air leaks, such as adding weatherstripping, caulking windows, or adding storm windows
- e. Purchased efficient appliances (such as a refrigerator, dishwasher, etc.)
- f. Purchased an efficient water heater
- g. Installed low flow shower heads or faucet aerators
- h. Installed water heater tank wrap or pipe insulation
- i. Installed new windows
- j. Had an energy assessment of your home

15. And which of these actions do you consistently take at home...? By consistently, I mean you do these things all or almost all the time throughout the year. [RANDOMIZE LIST] [1 = Yes, 2 = No, 98 = Don't know, 99 = Refused]

- a. Turn off lights when not in use
- b. Unplug electronic devices, adapters, or chargers when not in use
- c. Wash clothes in cold water
- d. Air dry laundry
- e. Take shorter showers

f. Turn down the temperature on your water heater
 16. Have you ...? [RANDOMIZE LIST] [1 = Yes, 2 = No, 98 = Don't know, 99 = Refused]

- a. Maintained or tuned-up heating or cooling equipment
- b. Used the sleep feature on computers and other electronics

17. Have you installed a programmable thermostat?

- 1. Yes [SKIP TO Q18]
- 2. No
- 98. Don't know
- 99. Refused

17a. Do you manually adjust the thermostat setting at night or when you are away?

- 1. Yes
- 2. No
- 98. Don't know
- 99. Refused

[ASK IF Q14, Q15, Q16, OR Q17 HAVE AT LEAST ONE "YES" RESPONSE]

18. What are the most important reasons you took these steps related to how you use energy at home?
 [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. To learn how my home uses energy
- 2. To save energy
- 3. To save money on utility bills
- 4. To obtain a rebate or program incentive
- 5. To replace old equipment
- 6. To replace broken equipment
- 7. To get more efficient equipment
- 8. To acquire the latest technology
- 9. To reduce maintenance costs
- 10. To increase comfort in the home
- 11. Previous experience with other utility programs
- 12. To help protect the environment
- 13. Recommended by contractors/trade allies
- 14. Recommended by family, friend, co-worker or neighbor
- 15. Part of a broader remodeling or renovation
- 97. Other [SPECIFY: _____]
- 98. Don't know

99. Refused

Willingness to Pay

19. Generally, it costs more to purchase energy-efficient products compared to products that meet the minimum requirements for energy efficiency. [RANDOMIZE LIST OF OPTIONS] [1= Very likely, 2= Somewhat likely, 3= Somewhat unlikely, 4= Very unlikely]

Options	i.	ii.	iii.	Initial Cost Difference
	Without a utility incentive, how likely would you be to install energy-efficient [OPTION] in the next five years? [IF RESPONSE > 1, ASK ii]	What if your utility paid 50% of the cost to upgrade to the energy efficient model? [IF RESPONSE > 1, ASK iii] [IF NEEDED, PROVIDE INITIAL COST DIFFERENCE]	How about if the incentive were 75% of the cost to upgrade? [IF NEEDED, PROVIDE INITIAL COST DIFFERENCE]	
19a. Lighting, such as (CFLs)				\$3 for 19W CFL (equivalent to 75W incandescent bulb)
19b. Central Air Conditioning				\$700 for Central A/C
19c. Space Heating, such as a furnace				\$207 for gas furnace; \$4,937 for electric furnace to ASHP conversion
19d. Appliances, such as a refrigerator				\$30 for top-mount refrigerator w/o ice dispenser
19e. Weatherization, such as energy efficient insulation				\$1,880 for ceiling insulation for a 2,000 sq.ft. home

Saturation and Intentions to Purchase Equipment

Now, I would like to ask you about the type of equipment and electronics you have in your home.

20. What is the primary type of heating system in your home? [READ LIST IF NEEDED, PROBE FOR FUEL TYPE AND DETAILS, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. Natural gas central forced air furnace
2. Natural gas hot water boiler (with radiators, baseboards or in the floor); also called natural gas hydronic heating
3. Electric hot water boiler (with radiators, baseboards or in the floor); also called electric hydronic heating
4. Natural gas steam boiler (with radiators)
5. Natural gas radiant floor heating
6. Natural gas fireplace or stove

7. Electric Baseboard, wall heaters (without fans), ceiling cables, or floor cables
8. Electric wall heaters with fans
9. Electric central forced air furnace
10. Air-source Heat pump (Electric)
11. Ground-source heat pump (Electric)
12. Portable heaters (Electric)
13. None (No heating system)
97. Other system and fuel [SPECIFY: _____]
98. Don't know
99. Refused

[ASK IF Q20 = HEAT PUMP OR FURNACE]

- 20a. Is your [HEAT PUMP OR FURNACE] a high-efficiency unit?
1. Yes
 2. No
 98. Don't know
 99. Refused

[ASK IF Q20 = HEAT PUMP OR FURNACE]

- 20b. Can you tell me approximately when you installed the [HEAT PUMP OR FURNACE]?
1. Within the past year
 2. 1-3 years ago
 3. 3-5 years ago
 4. More than 5 years ago
 98. Don't know
 99. Refused

21. What is the primary type of cooling system in your home? [READ LIST IF NEEDED, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. Central air conditioner
2. Air source heat pump
3. Ground source heat pump
4. Room air conditioners [SPECIFY NUMBER OF UNITS: _____]
5. Ductless mini-split air conditioner
6. Evaporative cooler (Swamp cooler)
7. Portable fans
8. Whole-house fan
9. Ceiling fans
10. None (no cooling system)
97. Other [SPECIFY: _____]
98. Don't know
99. Refused

[ASK IF Q21 = CAC]

21a. Is your central A/C a high-efficiency unit?

1. Yes
2. No
98. Don't know
99. Refused

[ASK IF Q21 = CAC OR HEAT PUMP]

21b. Can you tell me approximately when you installed the central A/C?

1. Within the past year
2. 1-3 years ago
3. 3-5 years ago
4. More than 5 years ago
98. Don't know
99. Refused

22. What type of water heater do you have in your home? [READ TYPES FROM LIST IF NEEDED, PROBE FOR FUEL TYPE]

1. Storage tank (this is the "standard" type with a water storage tank (Electric)
2. Storage tank (this is the "standard" type with a water storage tank (Natural gas)
3. Tankless (also called a demand or instantaneous water heater) (Electric)
4. Tankless (also called a demand or instantaneous water heater) (Natural gas)
5. Solar
97. Other [SPECIFY: _____]
98. Don't know
99. Refused

[ASK IF Q22 = STORAGE TANK]

22a. Is your storage tank water heater a high-efficiency unit?

1. Yes
2. No
98. Don't know
99. Refused

[ASK IF Q22 = STORAGE TANK]

22b. Can you tell me approximately when you installed the water heater?

1. Within the past year
2. 1-3 years ago
3. 3-5 years ago
4. 6-10 years ago
5. More than 10 years ago
98. Don't know
99. Refused

23. Do you have a set-top box for cable or satellite television?

1. Yes
2. No [SKIP TO Q24]
98. Don't know [SKIP TO Q24]
99. Refused [SKIP TO Q24]

23a. How many set-top boxes do you have in your home?

[SPECIFY QUANTITY: _____]

98. Don't know
99. Refused

24. Do you have a home audio system?

1. Yes
2. No [SKIP TO Q25]
98. Don't know [SKIP TO Q25]
99. Refused [SKIP TO Q25]

24a. How many home audio systems do you have in your home?

[SPECIFY QUANTITY: _____]

98. Don't know
99. Refused

25. Do you have a computer in your home?

1. Yes
2. No [SKIP TO Q26]
98. Don't know [SKIP TO Q26]
99. Refused [SKIP TO Q26]

25a. How many computers do you have in your home?

[SPECIFY QUANTITY: _____]

98. Don't know
99. Refused

25b. How many computer monitors do you have in your home?

[SPECIFY QUANTITY: _____]

98. Don't know
99. Refused

Home Characteristics and Demographics

We're almost finished. I just have a few questions about your household to make sure we're getting a representative sample of residents in your area.

26. Do you own or rent your home?

1. Own
 2. Rent
 98. Don't know
 99. Refused
27. When was your home built? If you don't know exactly, an estimate is fine.
[RECORD RESPONSE: _____]
98. Don't know
 99. Refused
28. What is the approximate square footage of your home?
[RECORD RESPONSE: _____]
98. Don't know
 99. Refused
29. How many stories is your home, not including an unfinished attic, unfinished basement, or garage?
1. 1
 2. 2
 3. 3
 4. More than 3
 98. Don't know
 99. Refused
30. Including yourself, how many people live in your home year-round?
[RECORD RESPONSE: _____]
98. Don't know
 99. Refused
31. Please tell me which of the following categories contains your age.
1. Under 18
 2. 18-34
 3. 35-65
 4. Over 65
 98. Don't know
 99. Refused
32. Do you have internet access at home?
1. Yes
 2. No
 98. Don't know
 99. Refused

Those are all the questions I have for you today. I would like to thank you for your time and the valuable information you provided.

LG&E/KU Commercial Survey

Objectives and Approach

To inform the energy-efficiency potential study and future program design, Cadmus will conduct telephone surveys with 200 commercial (office, retail, and restaurant) Louisville Gas & Electric and Kentucky Utilities customers. Cadmus will use the surveys to assess general attitudes toward energy efficiency and to gather information on program awareness, perceptions, and important factors that affect energy-efficiency decision making. The surveys will also be used to gather data to supplement existing saturation data and collect information on building characteristics. The survey is designed to explore the research topics presented in Table 1.

Table 2. Commercial Research Topics

Key Areas of Investigation	Research Topic	Survey Questions
Assess general attitudes toward energy efficiency	• Consideration of energy-efficient options	4, 37, 54
	• Company budget for energy-efficiency	38, 39
	• Recent efficient equipment purchases, actions taken to save energy	40, 41, 42, 43
	• Intentions to purchase energy-efficient equipment	45
	• Motivations to save energy	44
	• Barriers to saving energy	0
Gather information on program awareness and perceptions	• Awareness of energy-efficiency programs	47, 48, 6
	• Previous participation in energy-efficiency programs	9
	• Information sources for program information	12
Assess important factors in decision making around participation	• Major factors that contributed to decision to participate	10
	• If aware of but not participating: major factors that contributed to decision not to participate in energy-efficiency programs	11
	• Willingness to participate in programs / influence of rebates	19
Gather data to supplement existing saturation data	• Heating system type and fuel	56, 20
	• Cooling system type	58
	• Water heater quantity, type, fuel type and tank size	59, 60
	• Primary lighting system type and controls	61, 23
	• Quantity of lighting installed by type	63
	• (For restaurants only) Cooking equipment quantities and fuel types	64, 65, 66, 67, 68, 69
Gather building characteristic information	<ul style="list-style-type: none"> • Building type (high rise, single floor, big box, etc.) • Facility type (office, retail, etc.) • Facility size (sq. ft and # of stories) • % of heated and cooled floor space • Hours of operation 	35, 70, 71, 72, 73, 74, 75, 76

Key

[RED TEXT] – Instructions for programmer

[GREEN TEXT] – Instructions for interviewer

[BLUE TEXT] – Data to be pulled from sample

Introduction and Screening

Hello, may I speak with [CONTACT NAME]?

My name is [INTERVIEWER NAME] and I'm calling from EHI on behalf of [LG&E or KU]. We are conducting an important study to better understand how commercial customers use energy. This is not a sales call and your answers are confidential and will help [LG&E or KU] design programs to help you save energy and money.

[IF RESPONDENT ASKS "HOW LONG": This survey should take about 10-15 minutes.]

33. Are you the person in your organization who is responsible for energy-related decisions? [IF NEEDED: This would be the person who oversees spending on [ELECTRICITY/GAS/ELECTRICITY AND GAS] and energy-consuming equipment such as lighting and heating. It could be the director of facilities or operations, engineer or operations manager, the senior financial officer, or the owner.]

1. Yes [RECORD NAME AND TITLE: _____] [SKIP TO INTRODUCTION BEFORE Q35]
2. No
100. Don't know
101. Refused [THANK AND TERMINATE]

34. Could I speak to the person who is responsible for energy-related decisions?

1. Yes [RECORD NAME AND TITLE: _____]
2. No [THANK AND TERMINATE]
100. Don't know [THANK AND TERMINATE]
101. Refused [THANK AND TERMINATE]

Thank you in advance for your time. To give you a little background, we are speaking with commercial [LG&E or KU] customers to learn about energy-efficiency preferences and the types of equipment you currently have in your facility. This survey should take about 10-15 minutes. Is now a good time to talk, or is there a better time I can call you back? [SCHEDULE TIME TO CALL BACK OR CONTINUE]

35. Which of the following best describes your facility type? [READ APPROPRIATE OPTIONS FROM LIST BASED ON RESPONDENT TYPE]

1. Small office
2. Large office
3. Small retail
4. Multi-story later retail (e.g. department store)
5. Single-story large retail (e.g. Wal-Mart)

- 6. Quick service restaurant
- 7. Full service restaurant
- 97. Other [SPECIFY: _____]
- 98. Don't know
- 99. Refused

General Attitudes and Experience

First, I'd like to ask you some general questions about how your facility thinks about energy. There are no right or wrong answers to any of the questions in this survey, so please just give me your best response. [THROUGHOUT THE SURVEY, MAKE SURE RESPONDENTS HERE ARE FOCUSING ON ENERGY— THAT IS, ELECTRIC AND NATURAL GAS USAGE, NOT WATER. PLEASE DIRECT THEM BACK TO ENERGY USAGE IF THEY START TALKING ABOUT WATER USAGE.]

36. Please tell me how extensively you would say your organization has evaluated possible energy-efficiency upgrades when purchasing new equipment, undertaking facility renovations, or making other major capital improvements. Would you say that you...?

- 1. Evaluated possible energy-efficiency upgrades extensively
- 2. Evaluated possible energy-efficiency upgrades somewhat extensively
- 3. Did not evaluate possible energy-efficiency upgrades very extensively
- 4. Did not evaluate possible energy-efficiency upgrades as all
- 100. Don't know
- 101. Refused

37. What are the main things your company considers when deciding whether or not to invest in energy-saving measures? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. We don't consider investing in energy-saving measures
- 2. Ease of installation
- 3. Management support
- 4. First cost of energy-saving measures
- 5. Financial returns
- 6. Utility rebate programs
- 7. Expected business benefits/improvements
- 8. Sustainable business practices/ "green" marketing
- 9. Know someone who has done it successfully
- 97. Other [SPECIFY: _____]
- 98. Don't know
- 99. Refused

38. Does your capital budget include money for making energy-efficient upgrades?

- 1. Yes
- 2. No
- 98. Don't know

99. Refused
39. How about your operating budget? Does your operating budget include money for making energy-efficiency upgrades?
1. Yes
 2. No
 98. Don't know
 99. Refused
40. In the past 5 years, has your organization installed any energy-efficient equipment?
1. Yes
 2. No [SKIP TO Q42]
 98. Don't know [SKIP TO Q42]
 99. Refused [SKIP TO Q42]
41. What type of energy-efficient equipment was installed? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]
1. Efficient lighting systems
 2. Efficient air conditioner
 3. Efficient heating
 4. Efficient ventilation
 5. Efficient building envelop improvements
 6. Efficient motors
 7. Efficient refrigeration
 8. Efficient air compression
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused
42. Has your organization taken any other steps to save energy?
1. Yes
 2. No [SKIP TO Q44]
 98. Don't know [SKIP TO Q44]
 99. Refused [SKIP TO Q44]
43. What steps have you taken? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]
1. Had an energy audit/assessment/analysis
 2. Turn off lights when not in use
 3. Use sleep feature on computers or other electronics
 4. Unplug electronics when not in use
 5. Adjust thermostat settings when building is not occupied
 6. Maintained or tuned-up heating or cooling equipment
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused

[ASK IF Q40 OR Q42=1]

44. What are the primary reasons you decided to [INSTALL EFFICIENT EQUIPMENT AND/OR TAKE STEPS TO SAVE ENERGY]? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. To learn how my organization or building uses energy
2. To save energy
3. To save money on utility bills
4. To obtain a rebate or program incentive
5. To replace old equipment
6. To replace broken equipment
7. To get more efficient equipment
8. To acquire the latest technology
9. To reduce maintenance costs
10. To increase comfort in the building
11. Previous experience with other utility programs
12. To help protect the environment
13. Recommended by contractors/trade allies
14. Recommended by another retail/office/restaurant
15. Recommended by family, friend, co-worker or neighbor
16. Part of a broader remodeling or renovation
17. To support sustainable business practices / "green" marketing
18. Because the program was sponsored by [LG&E or KU]
100. Other [SPECIFY: _____]
101. Don't know
102. Refused

45. Does your facility have plans to install energy-efficient equipment in the next 5 years?

1. Yes
2. No
98. Don't know
99. Refused

Barriers

46. What obstacles do you face in trying to save energy at your facility? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. Nothing left to do/facility is already efficient
2. Can't afford it/too expensive/don't have money in operating budget
3. Energy-efficient equipment is not sufficiently cost-effective
4. Inconvenient, don't have the time, too busy
5. Existing equipment works fine

6. Don't know what to do/don't have the right information
7. Building has challenges in its construction or age
8. Too hard to install/implement
9. Not confident I'll save energy/it will be worth it
10. Afraid it will make us uncomfortable
11. Challenges with contractors
12. Don't have management/corporate support for making energy-efficiency upgrades
13. Saving energy is not a priority at my organization
100. Other [SPECIFY: _____]
101. Don't know
102. Refused

Program Awareness and Experience

Now, I'm going to ask you some questions about programs that are designed to help you save energy.

47. Are you aware of governmental agencies or electric or gas utilities that have programs to help you save energy at your facility?
 1. Yes
 2. No
 100. Don't know
 101. Refused

48. What programs are you aware of? [DO NOT READ, ALLOW MULTIPLE RESPONSES]
 1. LG&E/KU Commercial Energy Analysis Program
 2. LG&E/KU Commercial Rebate Program
 3. LG&E/KU programs (no specific program named)
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused

[ASK ONLY FOR PROGRAMS NOT NAMED IN Q48]

49. I'm going to read you some names of energy-efficiency programs. Please tell me if you had heard of each one before my call today. [RANDOMIZE LIST] [1 = Yes, 2 = No, 98 = Don't know, 99 = Refused]

- j. [LG&E or KU] Commercial Energy Analysis Program
 - k. [LG&E or KU] Commercial Rebate Program
50. To your knowledge, has your organization ever completed an energy analysis through your utility or received a rebate from your utility or other agency for purchasing efficient equipment? [ALLOW MULTIPLE RESPONSES]
 1. Yes, had an energy analysis
 2. Yes, purchased efficient equipment
 3. No [SKIP TO Q11]

- 100. Don't know [SKIP TO Q11]
- 101. Refused [SKIP TO Q11]

[ASK IF Q9 = 1 or 2]

51. What are the primary reasons you decided to [RESPONSE FROM Q9]? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. To learn how my organization or building uses energy
- 2. To save energy
- 3. To save money on utility bills
- 4. To obtain a rebate or program incentive
- 5. To replace old equipment
- 6. To replace broken equipment
- 7. To get more efficient equipment
- 8. To acquire the latest technology
- 9. To reduce maintenance costs
- 10. To increase comfort in the building
- 11. Previous experience with other utility programs
- 12. To help protect the environment
- 13. Recommended by contractors/trade allies
- 14. Recommended by another retail/office/restaurant
- 15. Recommended by family, friend, co-worker or neighbor
- 16. Part of a broader remodeling or renovation
- 17. To support sustainable business practices / "green" marketing
- 18. Because the program was sponsored by [LG&E or KU]
- 97. Other [SPECIFY: _____]
- 98. Don't know
- 99. Refused

[ASK IF Q47 = YES AND Q9 = NO]

52. What are the primary reasons you have not participated in programs to help you save energy at your facility? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. Nothing left to do/facility is already efficient
- 2. Can't afford it/too expensive/don't have money in operating budget
- 3. Energy-efficient equipment is not sufficiently cost-effective
- 4. Inconvenient, don't have the time, too busy
- 5. Existing equipment works fine
- 6. Don't know what to do/don't have the right information
- 7. Building has challenges in its construction or age
- 8. Too hard to install/implement
- 9. Not confident I'll save energy/it will be worth it
- 10. Afraid it will make us uncomfortable

11. Challenges with contractors
 12. Don't have management/corporate support for making energy-efficiency upgrades
 13. Saving energy is not a priority at my organization
 97. Other [SPECIFY: _____]
 98. Don't know
 99. Refused
53. What is the best way to inform customers like you about programs to help you save energy at your facility? [DO NOT READ, ALLOW MULTIPLE RESPONSES, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]
1. Bill insert from utility
 2. TV or radio advertisement by utility/efficiency program
 3. Newspaper advertisement by utility/efficiency program
 4. Phone call from utility staff
 5. Local organization
 6. Event
 7. Word of mouth (other business, friend, family member, neighbor, or co-worker)
 8. Internet/Website
 9. Advertising by a participating auditor/contractor
 10. Direct contact with a participating auditor/contractor
 100. Other [SPECIFY: _____]
 101. Don't know
 102. Refused

Energy Behaviors

Next, I'd like to ask you a few specific questions about how you use energy in your facility.

54. When you buy new appliances or equipment that use energy at your facility, do you always, sometimes, rarely, or never consider the amount of energy they use?
1. Always
 2. Sometimes
 3. Rarely
 4. Never
 98. Don't know
 99. Refused

Willingness to Pay

55. Energy-efficient equipment is typically more expensive to purchase, but in ongoing operations costs less due to reduced energy usage. [RANDOMIZE LIST OF OPTIONS] [1 = Very likely, 2 = Somewhat likely, 3 = Somewhat unlikely, 4 = Very unlikely]

	i.	ii.	iii.	
Options	Without a utility incentive, how likely would you be to install energy efficient [OPTION] in the next five years? [IF RESPONSE > 1, ASK ii]	What if your utility paid 50% of the cost to upgrade to the energy efficient model? [IF RESPONSE > 1, ASK iii] [IF NEEDED, PROVIDE % COST PREMIUM OVER BASE]	How about if the incentive were 75% of the cost to upgrade? [IF NEEDED, PROVIDE % COST PREMIUM OVER BASE]	% Cost Premium Over Base
19a. Lighting systems				5 - 15
19b. Air conditioning				10 - 25
19c. Space heating				5 - 20
19d. Ventilation				2 - 5
19e. Building envelope improvements				5 - 20
[ASK FOR RESTAURANT ONLY] 19f. Refrigeration				10 - 20

Saturation

Next, I would like to ask you a few questions about the types of equipment you have in your facility.

56. What is the primary fuel type used to heat your facility?

- 1. Electric
- 2. Natural gas
- 97. Other [SPECIFY: _____]
- 98. Don't know
- 99. Refused

57. What is the primary type of heating system in your facility? [READ LIST IF NEEDED, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. Hot water boiler
- 2. Steam boiler
- 3. Forced air furnace
- 4. Electric resistance baseboard
- 5. Heat pump
- 6. In-room packaged units
- 7. Rooftop packaged units
- 100. Other [SPECIFY: _____]
- 101. Don't know
- 102. Refused

[ASK IF Q20 = HEAT PUMP OR FURNACE]

20a. Is your [HEAT PUMP OR FURNACE] a high-efficiency unit?

- 3. Yes
- 4. No
- 100. Don't know
- 101. Refused

[ASK IF Q20 = HEAT PUMP OR FURNACE]

20b. Can you tell me approximately when you installed the [HEAT PUMP OR FURNACE]?

- 5. Within the past year
- 6. 1-3 years ago
- 7. 3-5 years ago
- 8. More than 5 years ago
- 100. Don't know
- 101. Refused

58. What is the primary type of cooling system in your facility? [READ LIST IF NEEDED, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

- 1. Central chilled water plant with constant volume air handler
- 2. Central chilled water plant with local VAV terminal units
- 3. Packaged rooftop units
- 4. Heat pumps
- 5. Wall or window in-room units
- 100. Other [SPECIFY: _____]
- 101. Don't know
- 102. Refused

[ASK IF Q58 = CAC OR HEAT PUMP]

58a. Is your [central A/C or heat pump] a high-efficiency unit?

- 3. Yes
- 4. No
- 100. Don't know
- 101. Refused

[ASK IF Q58 = CAC OR HEAT PUMP]

58b. Can you tell me approximately when you installed the [central A/C or heat pump]?

- 5. Within the past year
- 6. 1-3 years ago
- 7. 3-5 years ago
- 8. More than 5 years ago
- 100. Don't know
- 101. Refused

59. How many water heaters do you have in your facility?

[RECORD RESPONSE: _____]

- 100. Don't know

101. Refused

60. For each of the water heaters, please tell me the: [RECORD INFO FOR EACH WATER HEATER SEPARATELY AS 60ai-60aiii, 60bi-60bii, 60ci-60ciii, ETC.]

60ai. Water heater fuel type

1. Electric
2. Natural gas
3. Solar
97. Other [SPECIFY: _____]
98. Don't know
99. Refused

60aii. Water heater type

1. Storage tank
2. Tankless
3. Solar
98. Don't know
99. Refused

60aiii. Water heater tank size

- [RECORD RESPONSE: _____]
98. Don't know
 99. Refused

61. What is the main type of lighting system used at your facility? [READ LIST IF NEEDED, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. Incandescent
2. Compact fluorescent
3. T-8 overhead fluorescent
4. T-12 overhead fluorescent
5. Halogen
6. High intensity discharge (HID)
7. Daylighting
97. Other [SPECIFY: _____]
98. Don't know
99. Refused

62. What type of lighting controls, if any, do you have at your facility? [READ LIST IF NEEDED, RECORD VERBATIM IF RESPONSE DOES NOT MATCH CATEGORY]

1. Occupancy sensors
2. Dimmers
3. Electronic timers
4. Photosensors
5. None, it's all done manually
97. Other [SPECIFY: _____]

- 98. Don't know
- 99. Refused

63. Can you tell me how many of the following types of lighting you currently have installed in your facility? If you do not know for sure, an estimate is fine.

63a. Screw-based CFLs

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63b. LEDs

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63c. Incandescent bulbs

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63d. T5s

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63e. High performance T8s

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63f. T8s

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63g. T12s

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

63h. High intensity discharge fixtures

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

64. How many commercial refrigerators do you have in your facility?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

65. For each of the refrigerators, please tell what type of refrigerator it is. [IF NEEDED: Is it front opening with door, retail display, walk-in, or other?]

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

66. How many commercial freezers do you have in your facility?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

67. How many standard oven/ranges do you have in your facility?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

67a. What is the fuel type of each?

- 1. All electric
- 2. All natural gas
- 97. Other [RECORD QUANTITY OF ELECTRIC, NATURAL GAS, AND OTHER (SPECIFIED): _____]
- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

68. How many commercial ranges do you have in your facility?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

68a. What is the fuel type of each?

- 1. All electric

- 2. All natural gas
- 97. Other [RECORD QUANTITY OF ELECTRIC, NATURAL GAS, AND OTHER (SPECIFIED): _____]
- 98. Don't know
- 99. Refused

[ASK FOR RESTAURANTS ONLY]

69. How many grills and/or fryers do you have in your facility?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

69a. What is the fuel type of each?

- 1. All electric
- 2. All natural gas
- 97. Other [RECORD QUANTITY OF ELECTRIC, NATURAL GAS, AND OTHER (SPECIFIED): _____]
- 98. Don't know
- 99. Refused

Building Characteristics

We're almost finished. I just have a few questions about your building.

70. What is the total square footage of your facility?

[RECORD RESPONSE: _____]

- 100. Don't know
- 101. Refused

71. How many stories is your building?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

72. What percent of your floor space is heated?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

73. What percent of your floor space is cooled?

[RECORD RESPONSE: _____]

- 98. Don't know
- 99. Refused

74. What are your facility's operating hours on weekdays (Monday-Friday)? [RECORD HOURS AND MINUTES USING 24 HOUR CLOCK (EX: ENTER 0530, 1750 FOR OPEN AT 5:30 AM AND CLOSE AT 5:30 PM), ENTER 2400 FOR 24 HOURS AND 0 FOR CLOSED]

74a. Monday

[RECORD RESPONSE: _____]

100. Don't know

101. Refused

74b. Tuesday

[RECORD RESPONSE: _____]

98. Don't know

99. Refused

74c. Wednesday

[RECORD RESPONSE: _____]

98. Don't know

99. Refused

74d. Thursday

[RECORD RESPONSE: _____]

98. Don't know

99. Refused

74e. Friday

[RECORD RESPONSE: _____]

98. Don't know

99. Refused

75. What are your facility's operating hours on Saturday? [RECORD HOURS AND MINUTES USING 24 HOUR CLOCK (EX: ENTER 0530, 1750 FOR OPEN AT 5:30 AM AND CLOSE AT 5:30 PM), ENTER 2400 FOR 24 HOURS AND 0 FOR CLOSED]

[RECORD RESPONSE: _____]

98. Don't know

99. Refused

76. What are your facility's operating hours on Sunday? [RECORD HOURS AND MINUTES USING 24 HOUR CLOCK (EX: ENTER 0530, 1750 FOR OPEN AT 5:30 AM AND CLOSE AT 5:30 PM), ENTER 2400 FOR 24 HOURS AND 0 FOR CLOSED]

[RECORD RESPONSE: _____]

100. Don't know

101. Refused

The logo for CADMUS, featuring the word "CADMUS" in white, uppercase, sans-serif font on a dark blue rectangular background.

Those are all the questions I have for you today. I would like to thank you for your time and the valuable information you provided.

Appendix B. Summary of Findings from Primary Data Collection

Residential Phone Survey Memo

MEMORANDUM

To: Mike Hornung, Jason Knoy, Louisville Gas and Electric
From: The Cadmus Group, Inc.
Subject: Residential Phone Surveys
Date: 03/21/2013

This memo summarizes findings from 412 residential phone surveys completed by Cadmus and EHI, Inc. to inform the energy-efficiency potential study and program planning work.¹ This memo highlights the following research topics

- Assess awareness, perceptions, actions related to energy-efficiency
- Assess efficiency program awareness and perceptions
- Assess key factors affecting program participation
- Characterize customers' willingness to adopt energy-efficiency measures

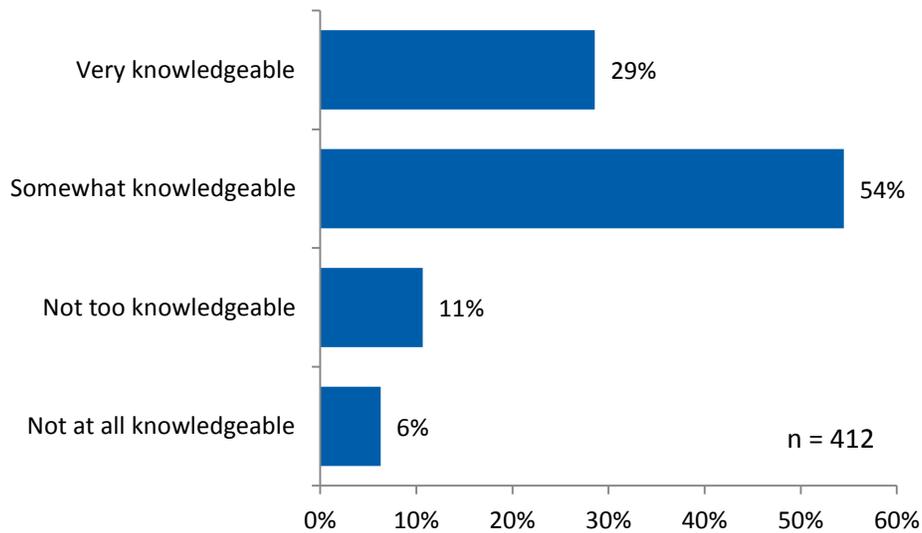
The memo summarizes results at the company level (LG&E and KU) — additional utility-level detail can be provided. Generally, Cadmus did not find statistically significant differences between LG&E and KU customers.

Awareness and Knowledge

Cadmus asked customers how knowledgeable they are in ways to save energy (Figure 1).

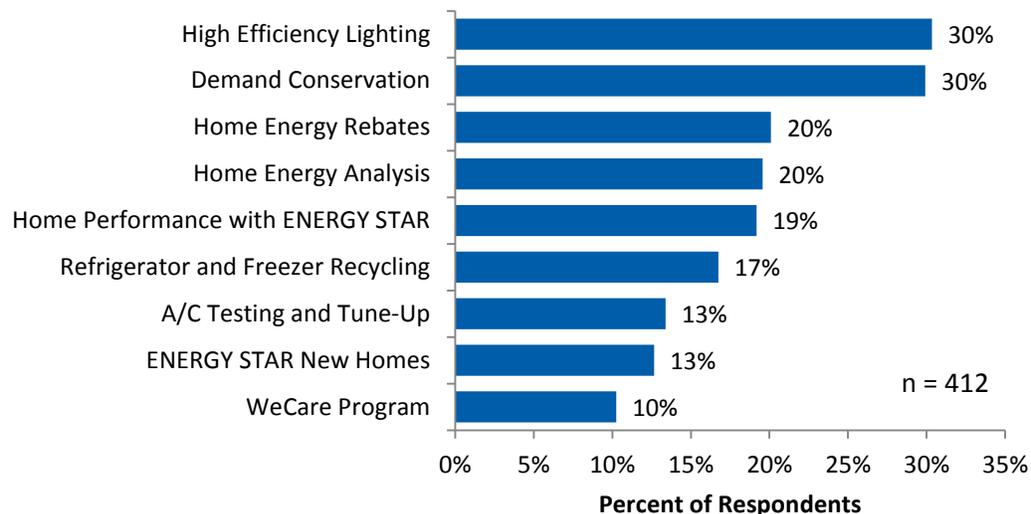
¹ Sample sizes for individual survey questions vary based due to non-response.

Figure 1. Knowledge of Ways to Save Energy



Eighty-three percent of customers reported they are either “very knowledgeable” or “somewhat knowledgeable”. When asked if they are aware of government or utility sponsored to give rebates, tax credits, or discounts on energy-efficiency measures, 46% of customers said yes. Awareness of energy-efficiency programs was not different for LG&E and KU customers. Figure 2 shows the programs that customers said they are familiar with.

Figure 2. Awareness of LG&E and KU Energy-Efficiency Programs



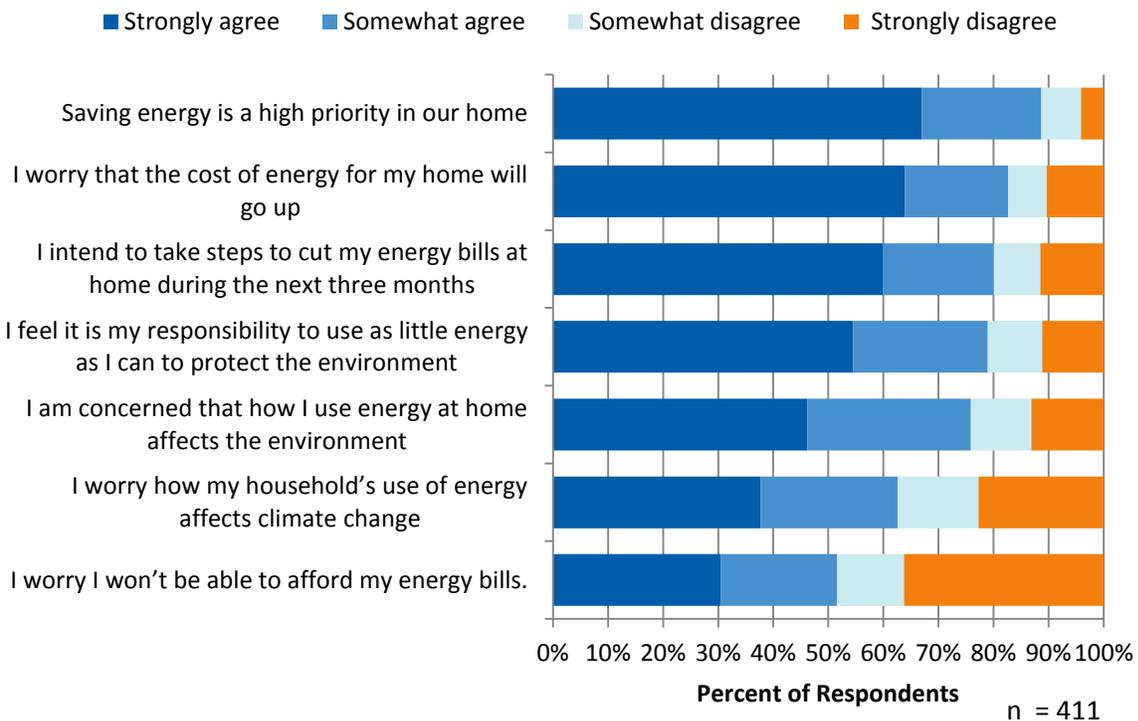
Customers are most familiar with LG&E and KU’s high-efficiency lighting and demand conservation programs— 30% of customers reported familiarity with either of these programs. Customers are least

familiar with ENERGY STAR New Homes and WeCare Programs (13%, and 10%, respectively). This is not surprising, as each of these programs reach a specific subset of LG&E and KU customers.

Attitudes towards energy-efficiency

Cadmus asked customers about their concerns and motivations to save energy to assess reasons why a customer might participate in an energy-efficiency program. Figure 3 shows customers’ concerns, with respect to energy.

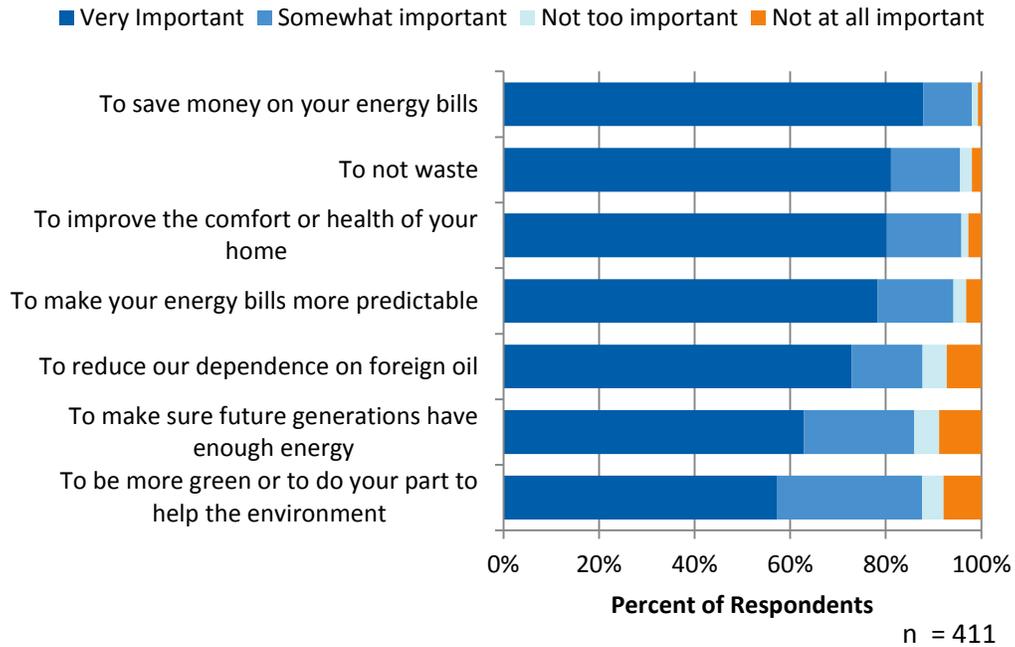
Figure 3. Concern and Personal Responsibility



Customers mentioned saving energy and the possibility of increased energy costs as concerns. Eighty-nine percent of customers agreed that saving energy is a high priority in their home. Eighty-three percent of customers are worried that the cost of energy for their home will go up. Customers are less concerned about climate change and their ability to pay energy bills. Sixty-three percent of customers said they worry about how their energy use affects climate change and 52% of customers are concerned that they won’t be able to afford their energy bills.

When asked about what motivates them to save energy, respondents mentioned money, waste and comfort (Figure 4).

Figure 4. Motivations to Save Energy

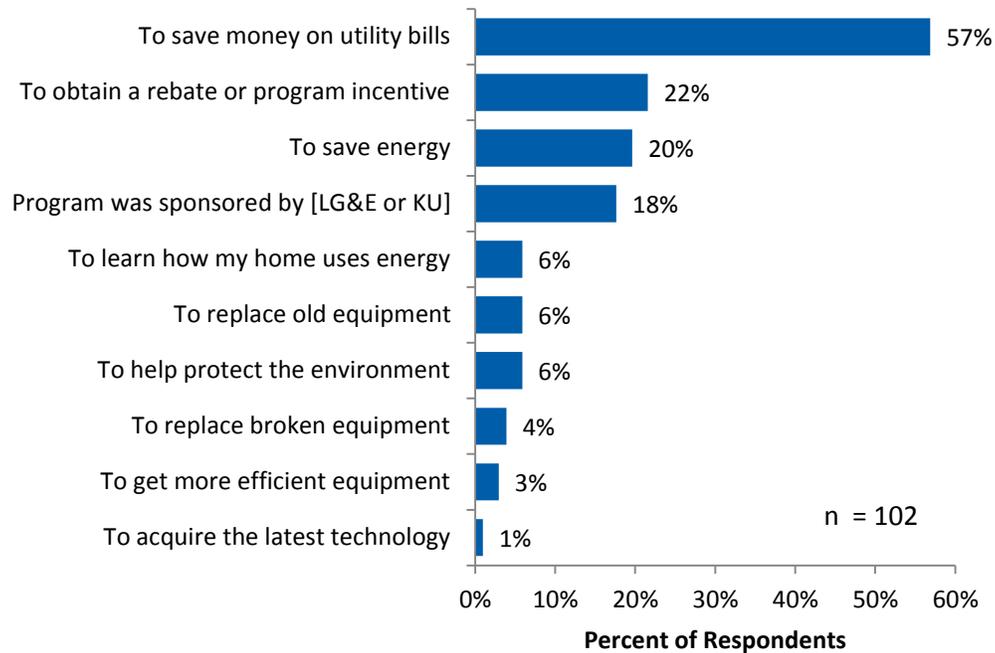


Ninety-eight percent of customers said energy bill savings motivates them to conserve energy. Customers also cited reducing waste (96%) and improved comfort (96%) as reasons to save energy. Concern about future generations and the environment are less important--86% and 87% reported these two factors are important, respectively.

Energy-Efficiency Program Awareness and Experience

Twenty-four percent said they had received a rebate, tax credit, or discount on services from a utility or government sponsored energy-efficiency program. Cadmus asked customers why they decided to participate in the program (Figure 5).

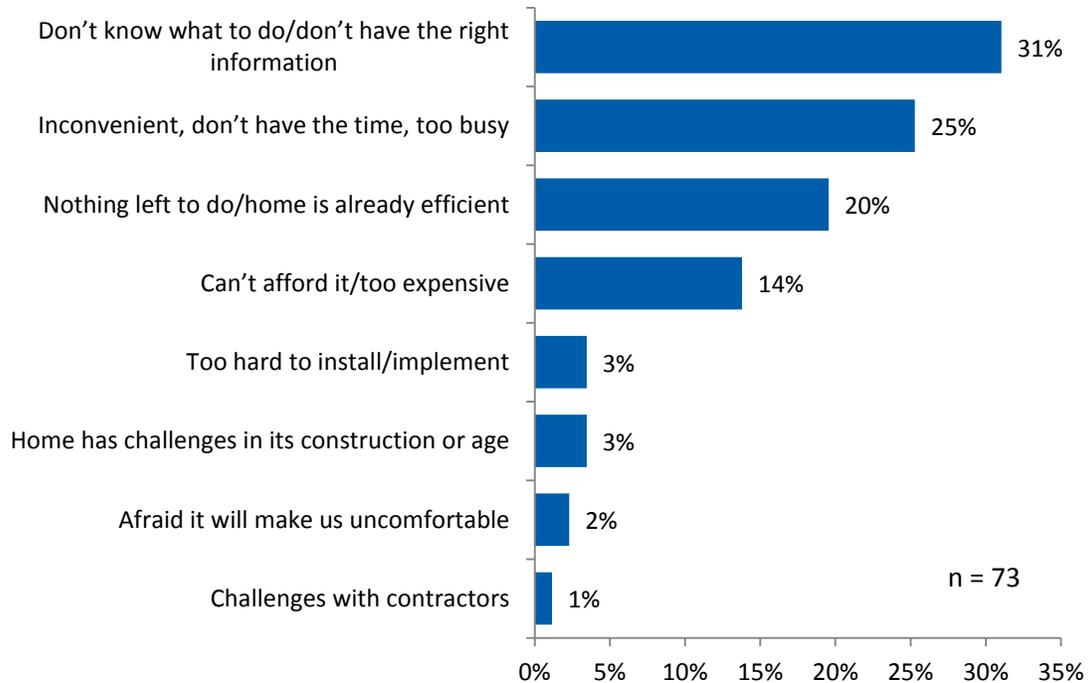
Figure 5. Reasons for Participating in Utility or Government Sponsored Energy-Efficiency Programs



Energy-efficiency program participants often mentioned bill savings as the reason why they participated in the program (57%). Twenty-two percent of participants said the utility incentive motivated them to participate in the program, and 20% mentioned the importance of saving energy.

Non-participants mentioned a lack of information and inconvenience as barriers to participating in energy-efficiency programs (Figure 6).

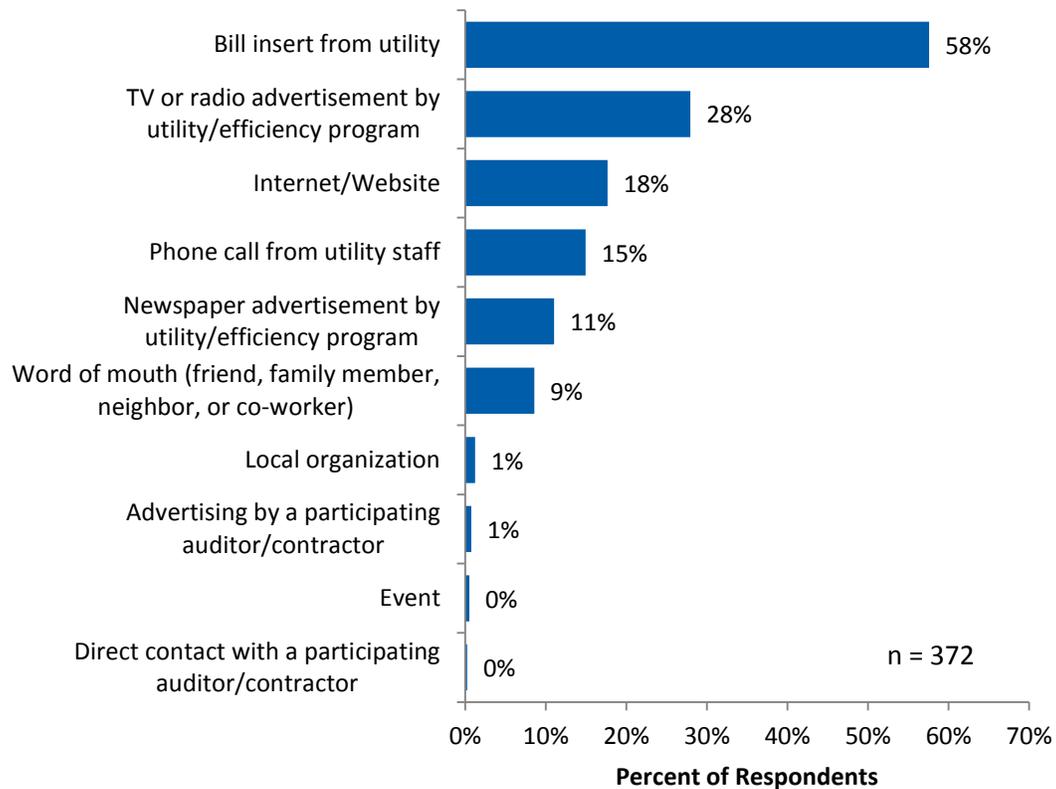
Figure 6. Reasons for Not Participating in Energy-Efficiency Programs



Thirty-one percent of non-participating respondents said they don't know what to do or don't have the right information. Twenty-five percent said they don't have time or are too busy. Few participants mentioned difficulty to install (3%) or problems with contractors (1%).

Cadmus asked customers about the best ways to inform them of energy-efficiency programs (Figure 7).

Figure 7. Best Way to Inform Customers of Energy-Efficiency Programs

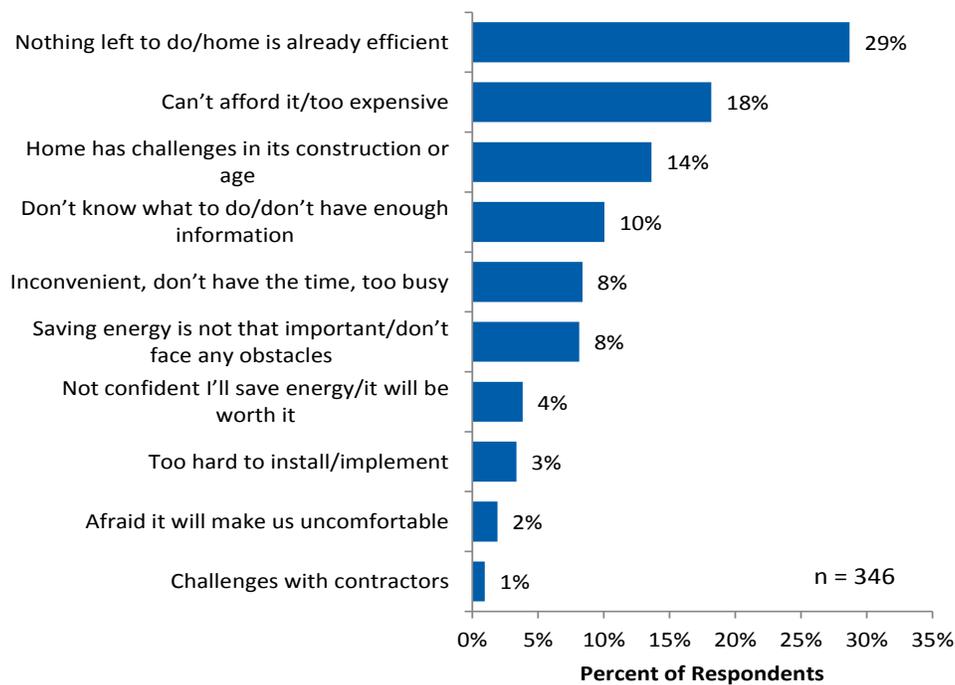


Customers said bill inserts and TV/radio advertisements are the best means of advertising energy-efficiency programs (58% and 28%, respectively). Few customers mentioned advertising or direct contact through contractors as good ways to reach them (1%, and <1%, respectively).

Barriers to Energy-Efficiency and Energy Behaviors

Cadmus asked customers about the obstacles they face in trying to save energy in their home (Figure 8).

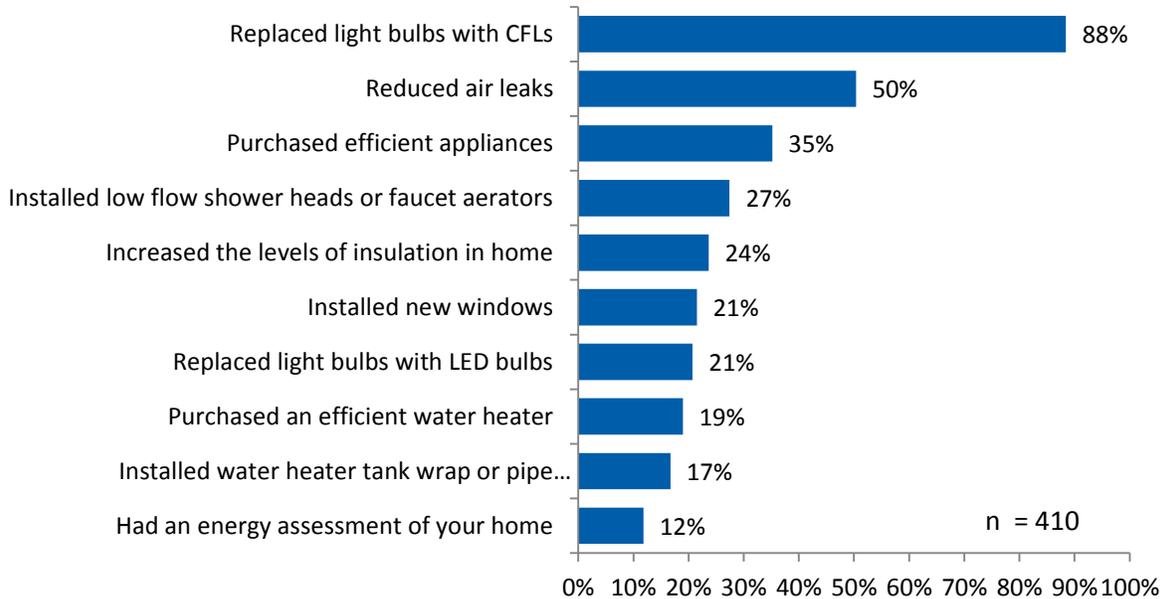
Figure 8. Obstacles to Saving Energy



Customers mentioned a limited number of options and cost as major barriers to saving energy in their home. Twenty-nine percent said they have nothing left to do in their home (or their home is already efficient) and 18 percent said they can't afford energy-efficiency measures.

When asked what they have done to save energy in the past year, many customers mentioned installing Compact Fluorescent Lamps (CFLs) and infiltration reducing measures (caulking, weatherstripping, etc.).

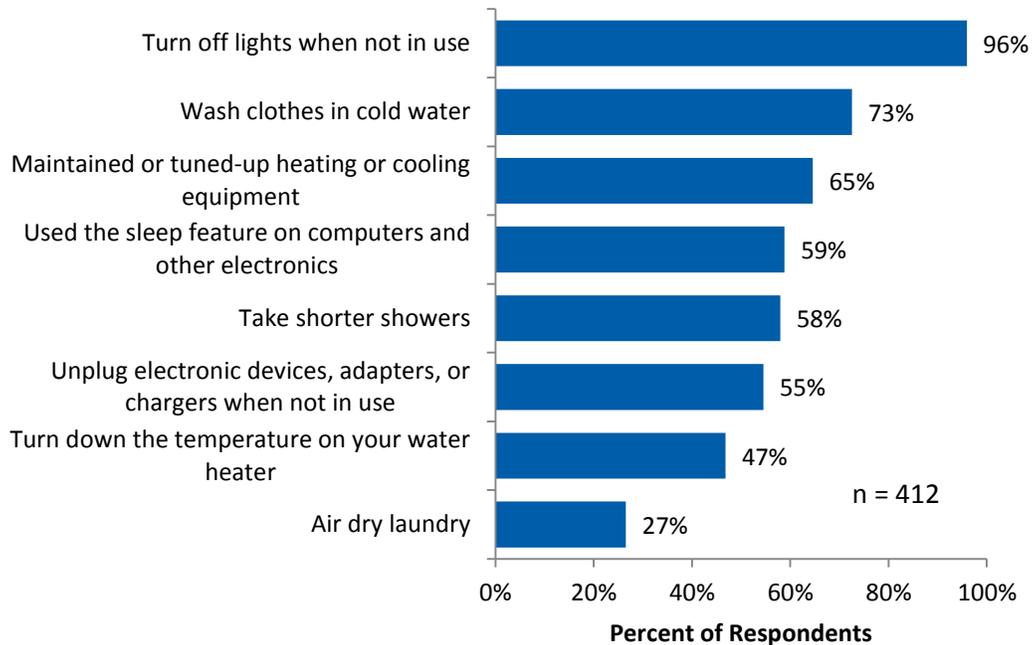
Figure 9. Energy-Saving Measures Installed in Past Year



As shown in Figure 9, eighty-eight percent of customers replaced incandescent light bulbs with CFLs in the past year. Fifty percent of customers installed an air sealing measure (caulk, weatherstripping, door sweeps). Customers were less likely to mention higher cost measures such as windows, LED light bulbs, and efficient water heaters (21%, 21%, and 19%, respectively).

Common behaviors for saving energy include turning-off lights when not in the room, washing laundry in cold water and maintaining tuned-up heating and cooling equipment (Figure 10).

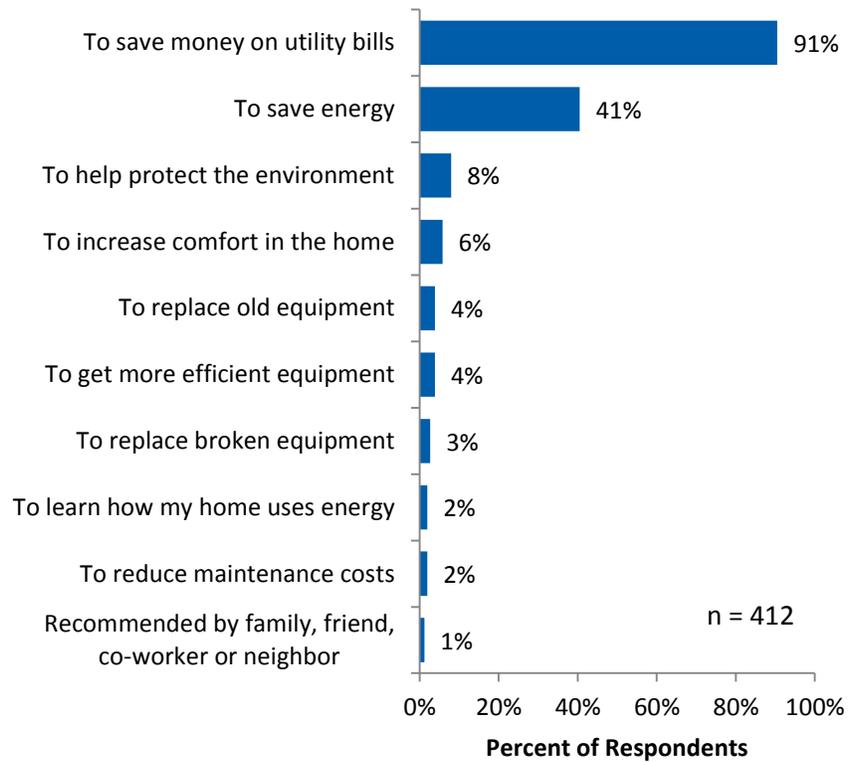
Figure 10. Common Energy-Saving Behaviors



Ninety-six percent of customers said they turn-off lights when not in use. Seventy-three percent said they wash clothes in cold water to save water heater energy consumption. Sixty-five percent of customers said they maintain tuned-up heating and cooling equipment. Customers reported they are less likely to reduce the temperature on their water heater (47%) or air dry laundry (27%).

The reasons customers adopted these energy-saving behaviors are similar to the reasons why customers install energy-efficiency measures (Figure 11).

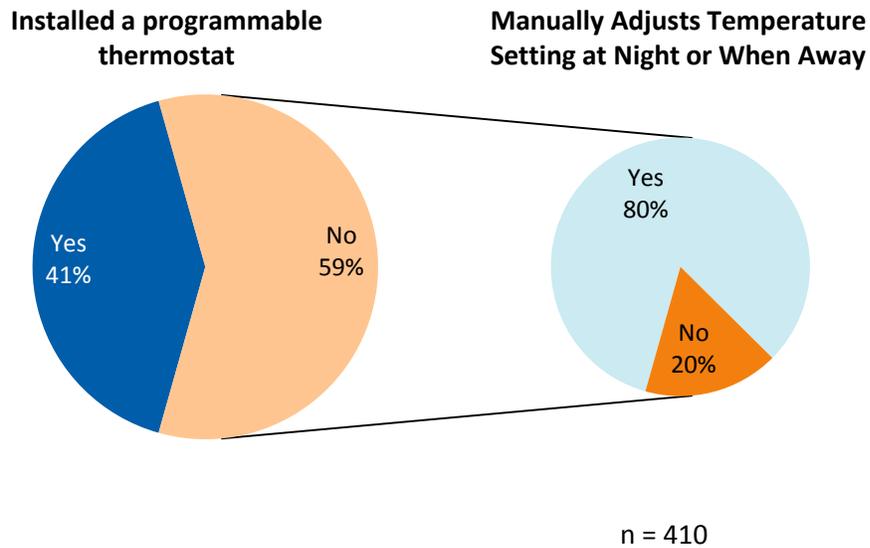
Figure 11. Reason for Installing Measures or Adopting Energy-Saving Behaviors



Ninety-one percent of customers said they adopted an energy-saving behavior to save money on their utility bills. Forty-one percent said they adopted these behaviors to “save energy” in general.

Cadmus also asked customers about how they use their thermostat (Figure 12).

Figure 12. Thermostat Type and Behavior

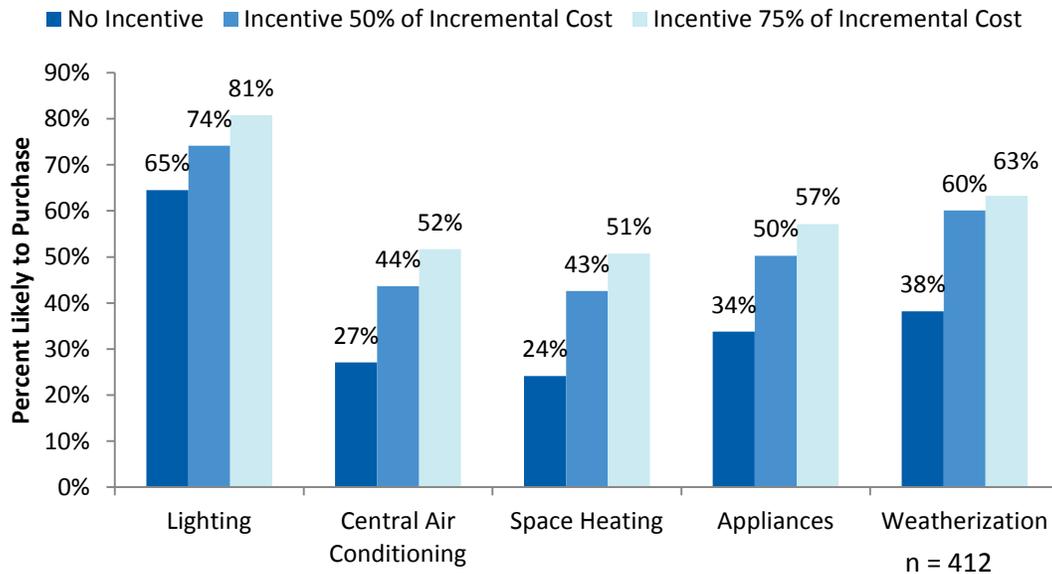


Fifty-nine percent of customers said they do not have a programmable thermostat. Of those customers, 80% said

Willingness-to-Adopt Energy-Efficiency Measures

Cadmus asked respondents about their willingness to purchase an energy-efficiency measure, given a certain incentive level—either no incentive, an incentive that covers 50% of the cost to upgrade, or an incentive that covers 75% of the cost to upgrade (Figure 13).

Figure 13. Willingness-to-Adopt Energy-Efficiency Measures



Eighty-one percent of customers said they would purchase efficient lighting if an incentive covered 75% of the cost to upgrade. A lower percentage of customers said they would purchase more expensive equipment such as efficient central air conditioning, space heating, appliances, and weatherization, if offered an incentive. Fifty-two percent of said they would purchase an efficient central air conditioner if an incentive covered 75% of the incremental cost. Fifty-seven percent of customers said they would purchase efficient appliances if an incentive covered 57% of the incremental cost. Slightly more customers said they would upgrade weatherization if given an incentive (63% said they would if the incentive covered 75% of the cost to upgrade).

Commercial Phone Survey Results Memo

MEMORANDUM

To: Mike Hornung, Jason Knoy, Louisville Gas and Electric
From: The Cadmus Group, Inc.
Subject: Commercial Phone Surveys
Date: March 28, 2013

This memo summarizes findings from 196 commercial phone surveys completed by Cadmus and EHI, Inc. Cadmus fielded the surveys to inform the energy-efficiency potential study and program planning work.² This memo highlights Cadmus' the following research areas:

- Assess awareness, perceptions, actions related to energy-efficiency
- Assess efficiency program awareness and perceptions
- Assess key factors affecting program participation
- Characterize customers' willingness to adopt energy-efficiency measures

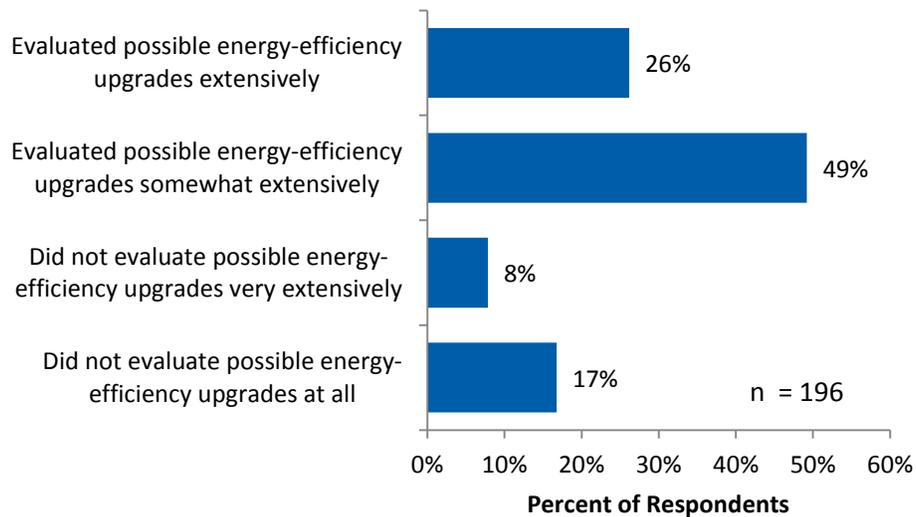
Results are presented at the company level (LG&E and KU) — additional utility-level detail can be provided. Generally, Cadmus did not find statistically significant differences between LG&E and KU customers.

General Attitudes and Experience

Cadmus asked commercial customers whether they have evaluated opportunities to save energy extensively (Figure 14).

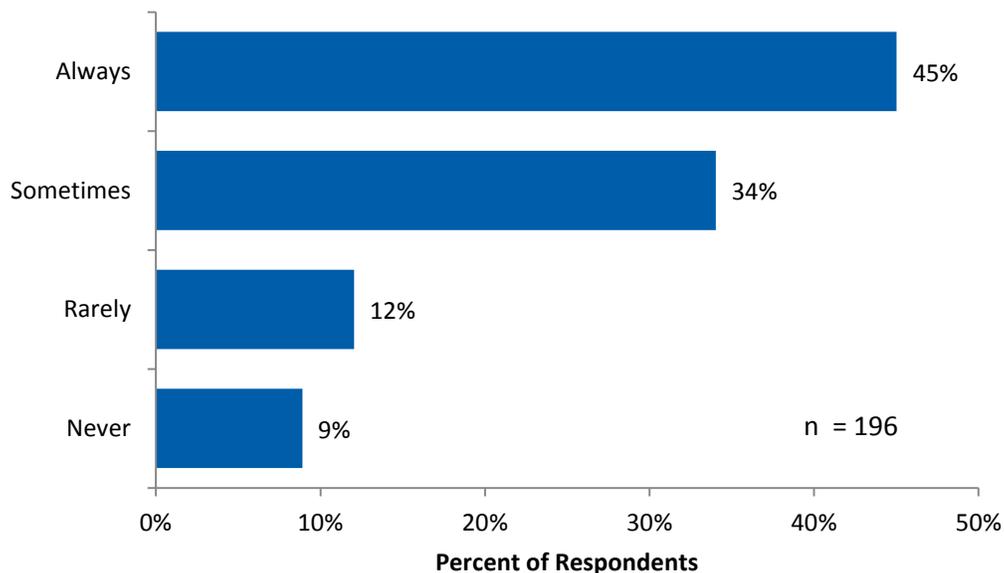
² Sample sizes for individual survey questions vary based due to non-response.

Figure 14. Extent to Which Organization has Evaluated Opportunities to Save Energy



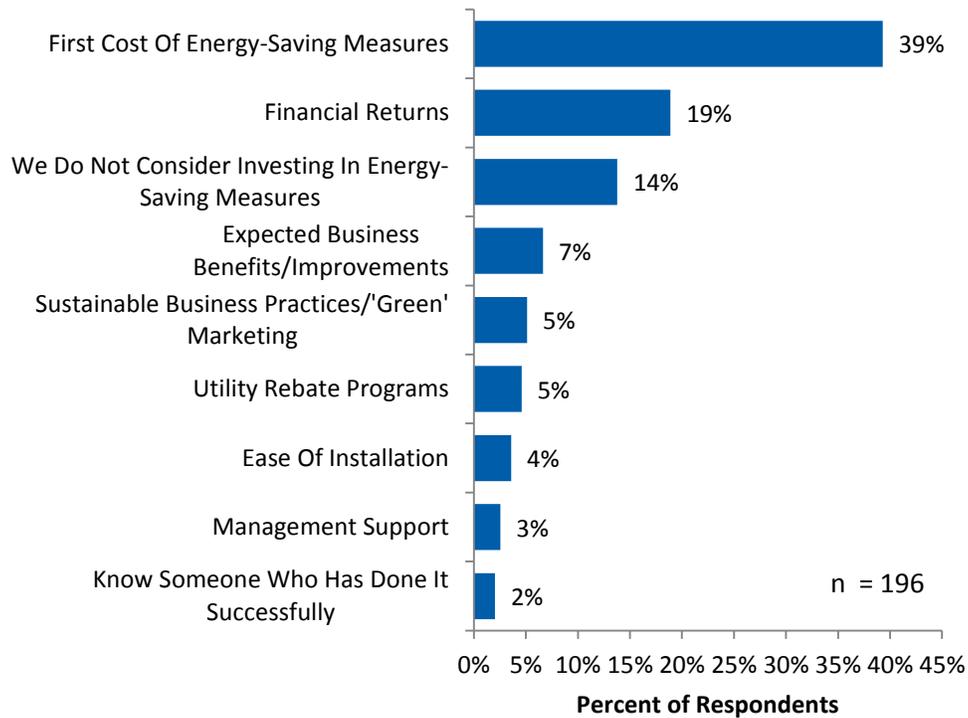
Seventy-five percent of respondents said they had either evaluated possible energy-efficiency upgrades “extensively” or “somewhat extensively.” Seventeen percent of customers said they have not evaluated energy-efficiency upgrades at all. A similar proportion of customers say they either “always” or “sometimes” consider energy consumption when purchasing new equipment (Figure 15).

Figure 15. Considers Energy Consumption When Buying New Equipment for Facility



Customers said they most-often consider the first-cost of the energy-saving measures and financial returns when deciding to invest in energy-efficiency (Figure 16).

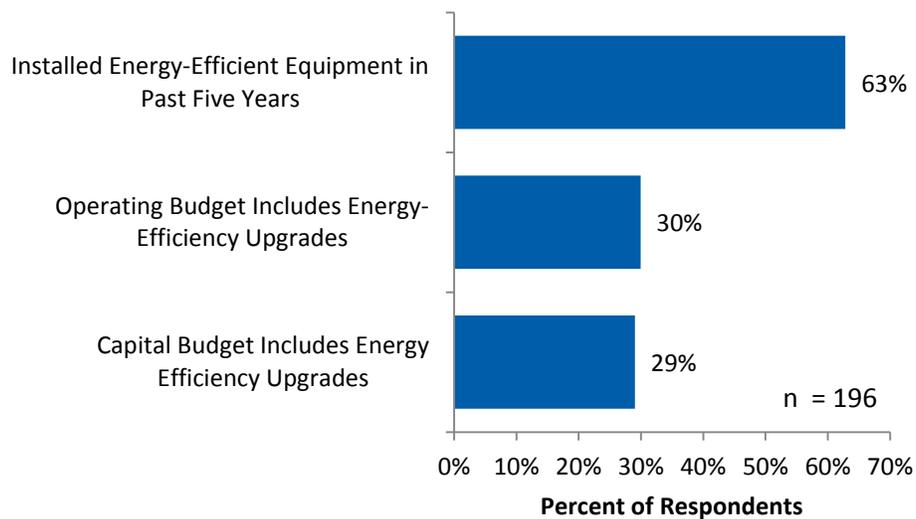
Figure 16. Considerations When Deciding to Invest in Energy-Efficiency



Thirty-nine percent of commercial customers identify the first-cost of a measure as a consideration when deciding to invest in energy-efficiency. Nineteen percent of customers mentioned “financial returns” as a consideration when deciding to invest.

Figure 17 shows the percent of customers who have made energy-efficient investments in the past five years and plan for investments in energy-efficiency.

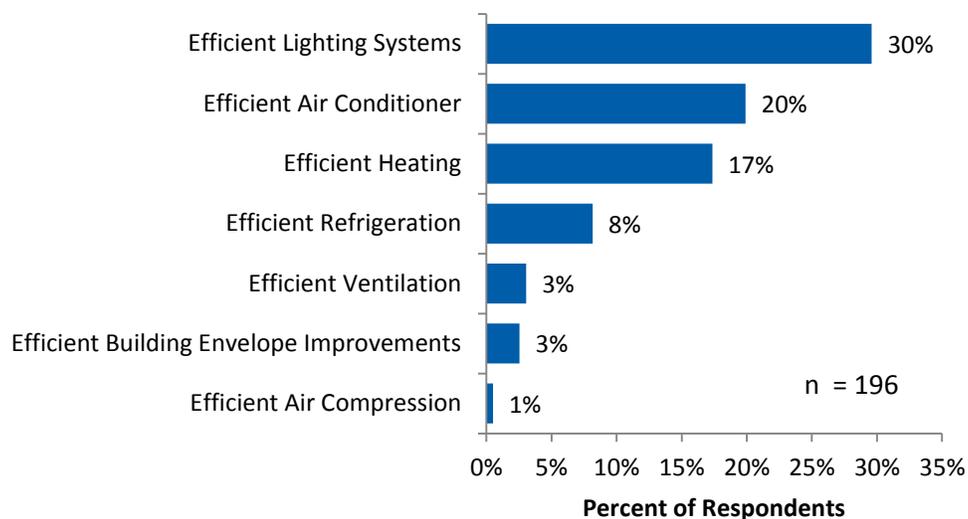
Figure 17. Historic and Budgeted Energy-Efficiency Investments



Sixty-three percent of customers have made investments in energy-efficiency in the past five years. A smaller percent of customers includes energy-efficiency upgrades in either their operating budget or capital budget (30% and 29%, respectively). This smaller percent likely reflects either 1) customer who invest in energy-efficiency don't always plan for it in their budgets or 2) customers who have invested in energy-efficiency do not plan to make future investments.

Figure 18 lists energy-efficiency measures installed by commercial customers.

Figure 18. Energy-Efficient Measures Installed in the Last Five Years

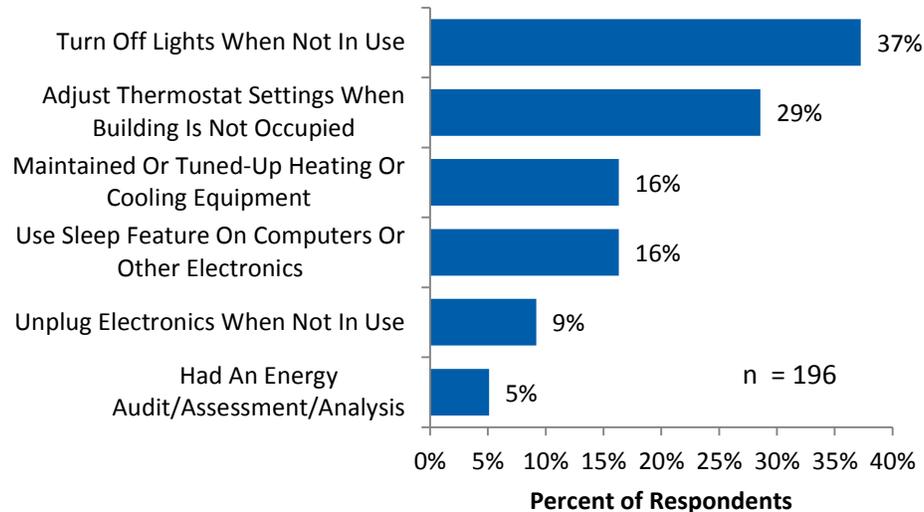


Respondents mentioned lighting and HVAC measures when asked what they installed in the last five years. Thirty percent of customers said they installed efficient lighting systems and 20% said they

installed efficient heating. Few customers said they made efficient building envelope improvements (3%).

Cadmus also asked about additional steps the respondent's organization has taken to save energy (Figure 19).

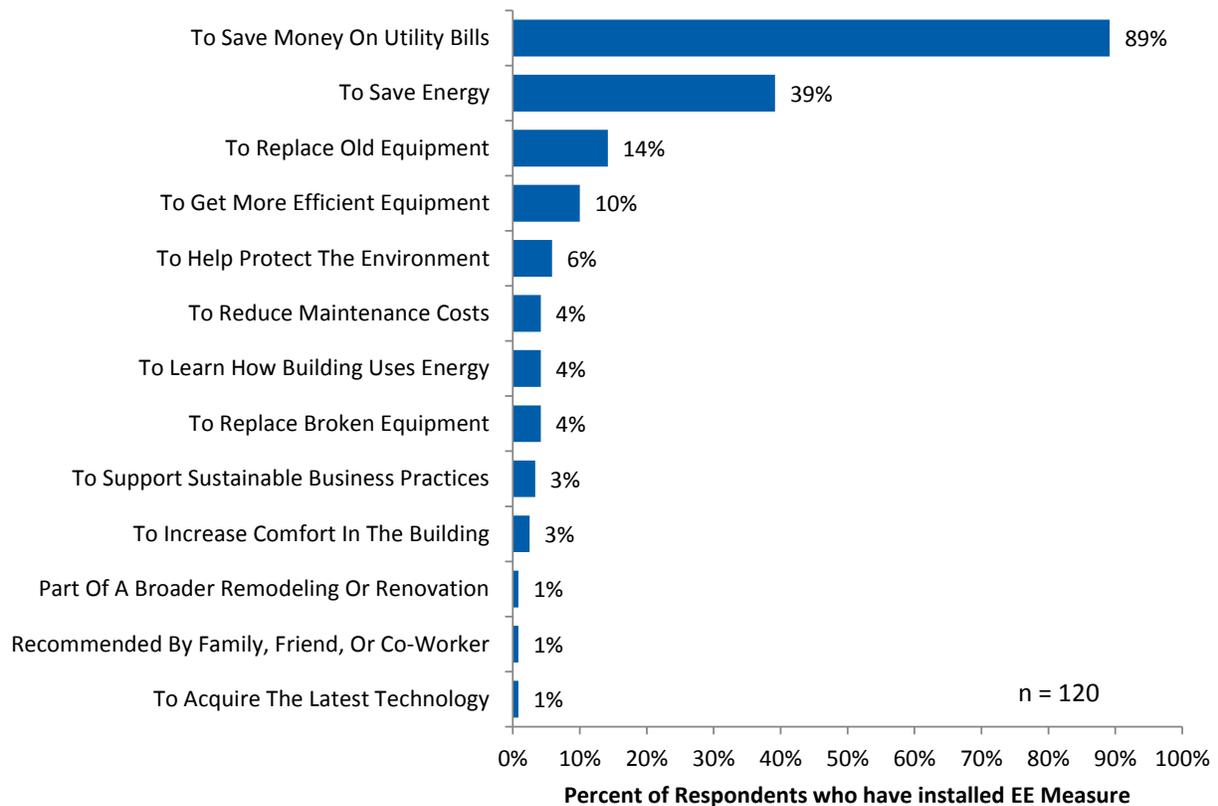
Figure 19. Additional Steps Taken to Save Energy



Similar to residential customers, commercial customers mentioned said other energy-saving actions include turning lights off when not in use (37%), adjusting the thermostat when their building is not occupied (29%) and maintaining tuned-up HVAC equipment (16%).

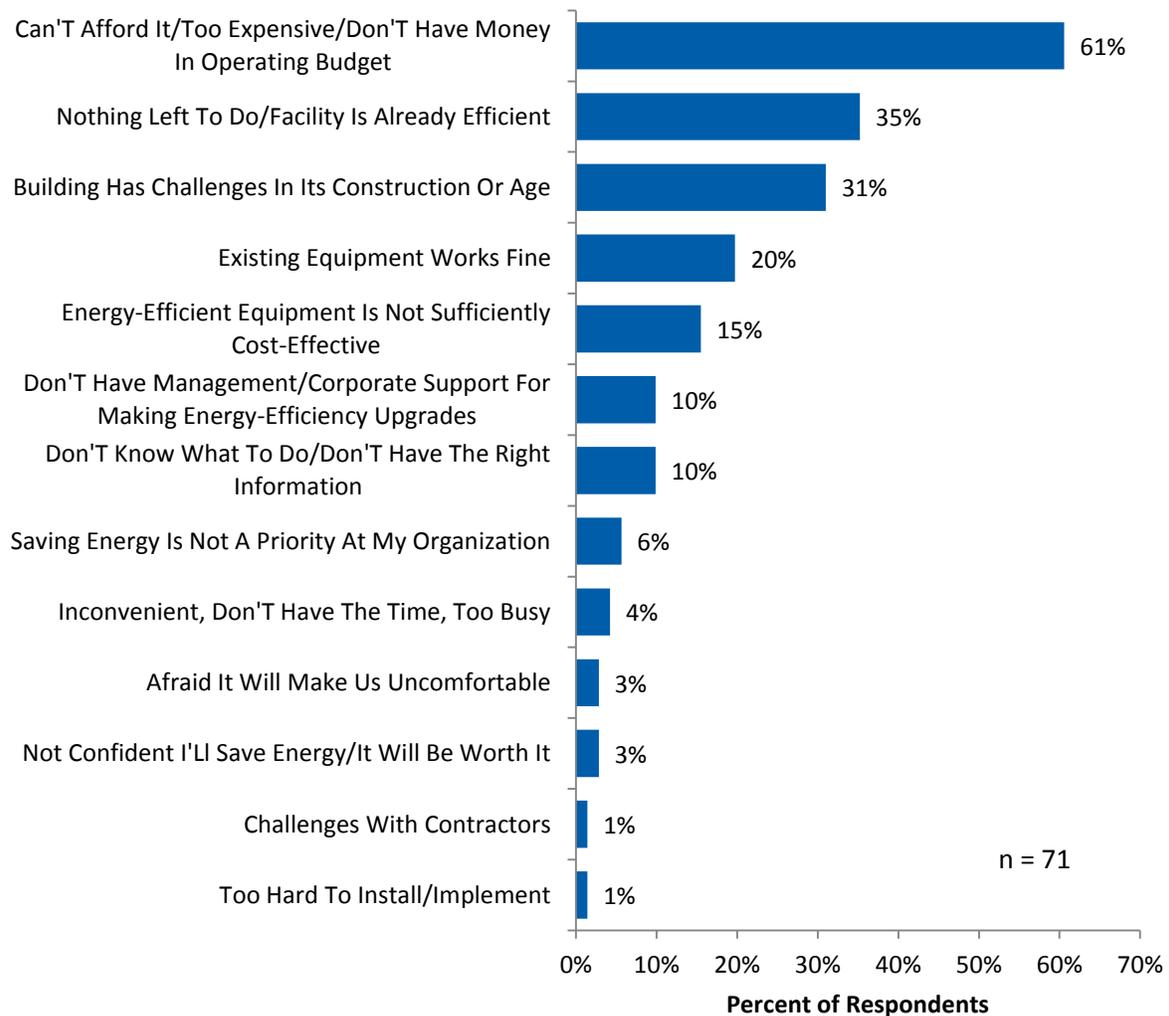
When asked why they made investments in energy-efficiency, respondents provided the reasons shown in Figure 20.

Figure 20. Reason for Investing in Energy-Efficient Upgrades



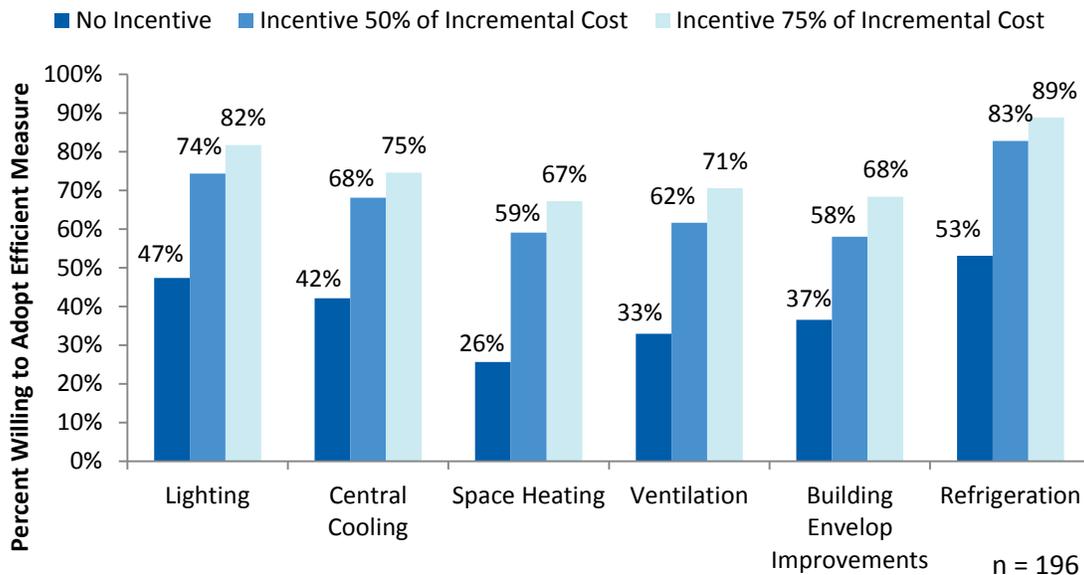
Saving money on utility bills and saving energy in general are the primary reasons why commercial customers install energy-efficiency measures (89% and 39%, respectively). Figure 21 lists reasons why customers chose not to install energy-efficiency measures.

Figure 21. Reasons for Not Pursuing Energy-Efficient Upgrades



Sixty-one percent of customers cited cost as a reason why they chose not to invest in energy-efficient upgrades. Thirty-five percent of customers said their building is already efficient and they have nothing left to do. Thirty-one percent of customers mentioned their building's construction or age as a barrier to installing energy-efficiency measures. Commercial customers often mention cost as a reason for not making efficient upgrades. These customers, in turn, say monetary incentives will influence their willingness to adopt efficient measures. Cadmus asked customers about their willingness-to-purchase efficient upgrades based on three incentive scenarios (no incentive, 50% of the cost to upgrade, and 75% of the cost to upgrade). Figure 22 summarizes customers' willingness to adopt energy-efficiency measures.

Figure 22. Willingness to adopt Energy-Efficiency Measures



For each end use category, customers indicated that higher incentives would increase the likelihood they would upgrade to efficient equipment. For high cost measures such as HVAC and shell improvements, a lower percentage of customers said they would invest in an efficient measure, absent any incentive (26% to 42%). For lower cost measures, such as lighting and refrigeration, the percent of customers who said they would install an efficient measure without an incentive is higher (47% and 53%, respectively).

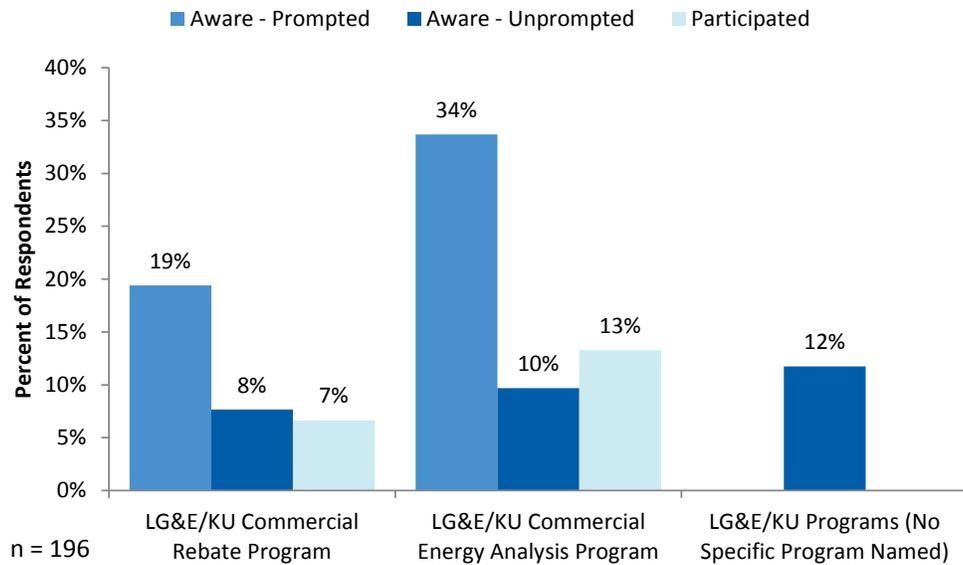
Program Awareness and Experience

To inform program planning, Cadmus asked commercial customers about their awareness of and experience with LG&E and KU energy-efficiency programs. These questions covered

- Awareness of energy-efficiency programs
- Previous participation in energy-efficiency programs.
- Sources for program information
- Factors that contribute to the decision to participate or not participate

Cadmus first asked the customer if they were aware of LG&E, KU, or government sponsored programs to save energy—43% of respondents reported familiarity with energy-efficiency programs. Figure 23 shows the proportion of customers who are familiar with specific LG&E or KU programs.

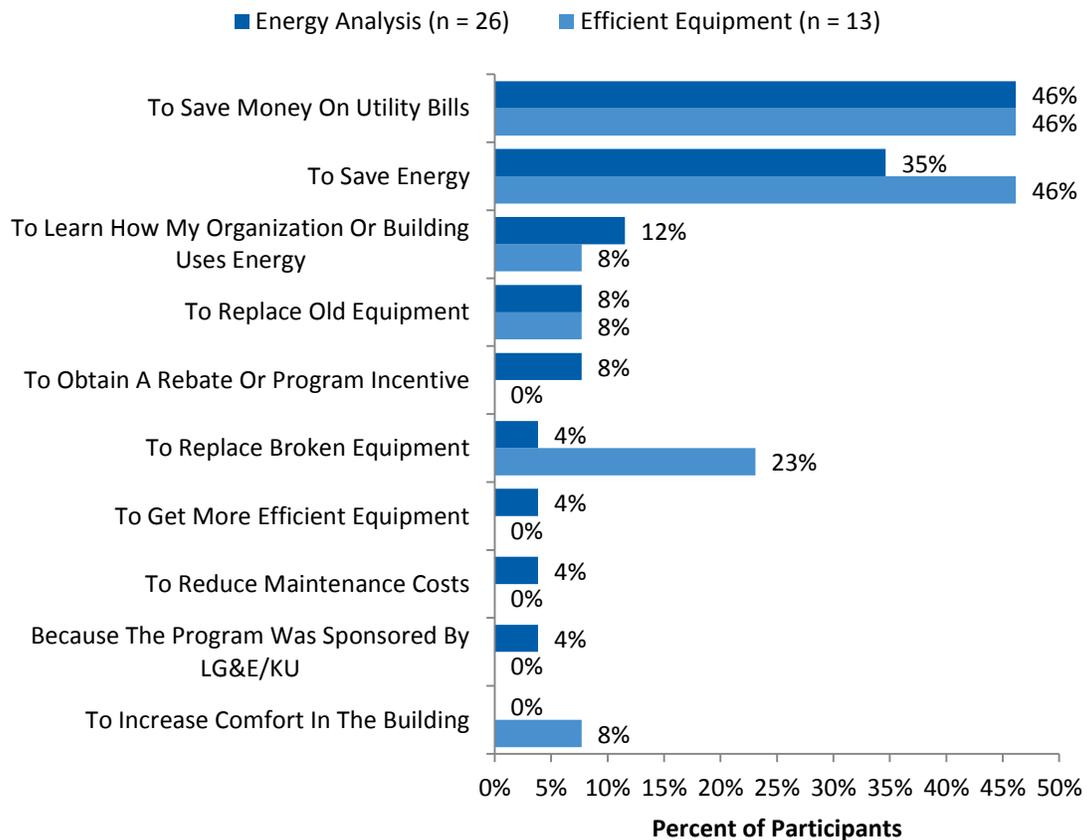
Figure 23. Awareness of Energy-Efficiency Programs



When unprompted, roughly 12% of customers reported familiarity with LG&E or KU energy-efficiency programs. After the given more information about the programs, more customers said they were familiar. Thirty-four percent of customers said they knew of LG&E or KU's Energy Analysis program and 19% of customers said they were familiar with LG&E or KU's commercial rebate program. Thirteen percent of respondents said their company had participated in the energy analysis program and 7% said they had participated in the commercial rebate program.

Cadmus asked these participants why they participated in these programs (Figure 24).

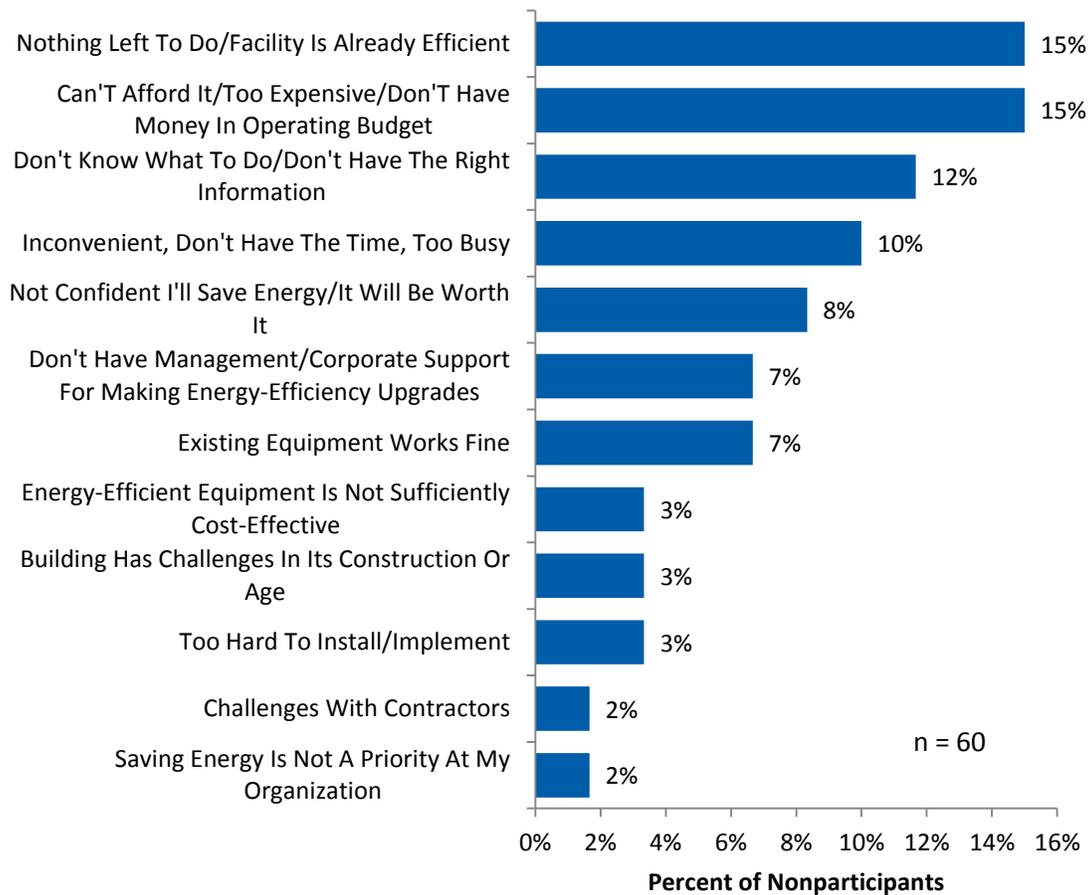
Figure 24. Reasons for Participating in Energy-Efficiency Program



For both programs, customers mentioned bill savings and energy savings as primary reasons for participating in the program. Unsurprisingly, efficient equipment participants said they used the program to replace broken equipment.

Cadmus asked the 30% of customers who are aware of programs but have not participated, why they have not participated (Figure 25).

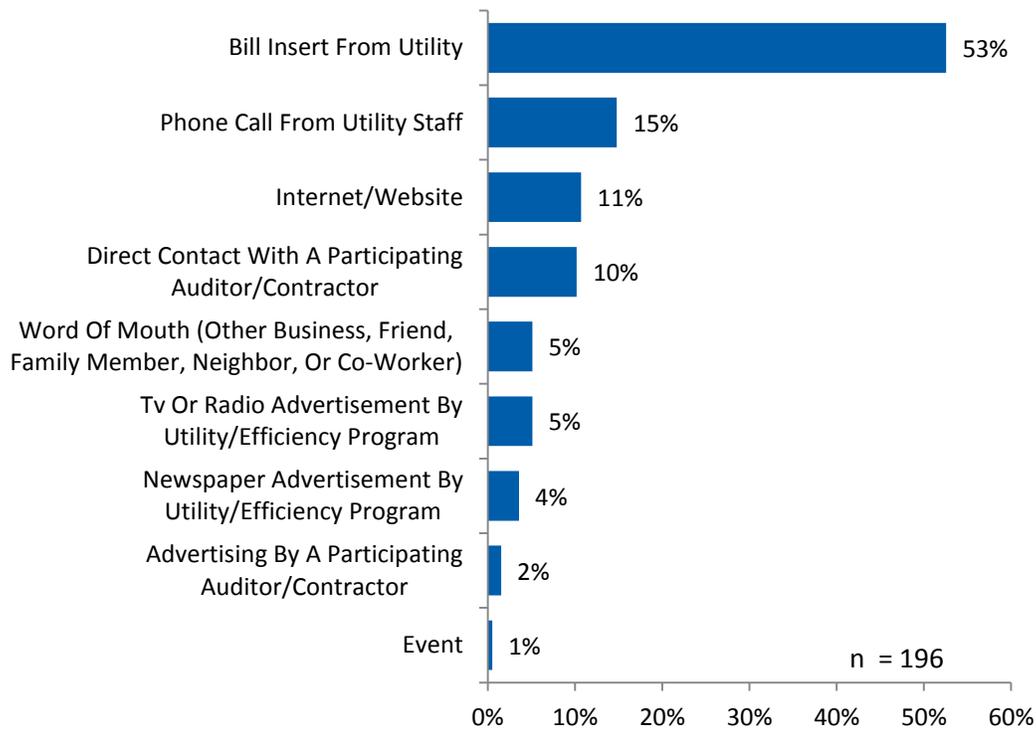
Figure 25. Reasons for Not Participating in Energy-Efficiency Programs



Non-participants mentioned limited remaining opportunities for energy -efficiency and cost as two reasons why they have not participated in utility sponsored programs (15% of customers for each response). Other reasons include insufficient information (12%), inconvenience (10%), and uncertainty about whether energy savings will be worth it (8%).

Figure 26 shows the different ways customers would like to be informed of energy -efficiency programs.

Figure 26. Best Way to Inform Customers of Energy-Efficiency Programs



Most customers said bills inserts are the best way to inform them of energy -efficiency programs (53%). These, however, are not always the most effective way of informing commercial customers of programs. Staff in charge of energy management decisions may not see utility bills, and therefore, may not see inserts about programs. LG&E informs commercial customers either through direct contact or through participating contractors or trade -allies. Fifteen percent of customers said a direct call from utility staff is the best way to inform them of programs, and 10% said direct contact with a participating contractor is the best way.

Appendix C. Baseline Data

The following graphs show baseline electric and gas forecasts by sector and segment for both LG&E and KU. The following tables show assumptions of gas and electric equipment, fuel shares, annual per unit energy consumption for residential end uses, and annual per square foot energy consumption for commercial end uses.

Figure C27. Residential Electric Baseline Forecast (KU) 2014-2033

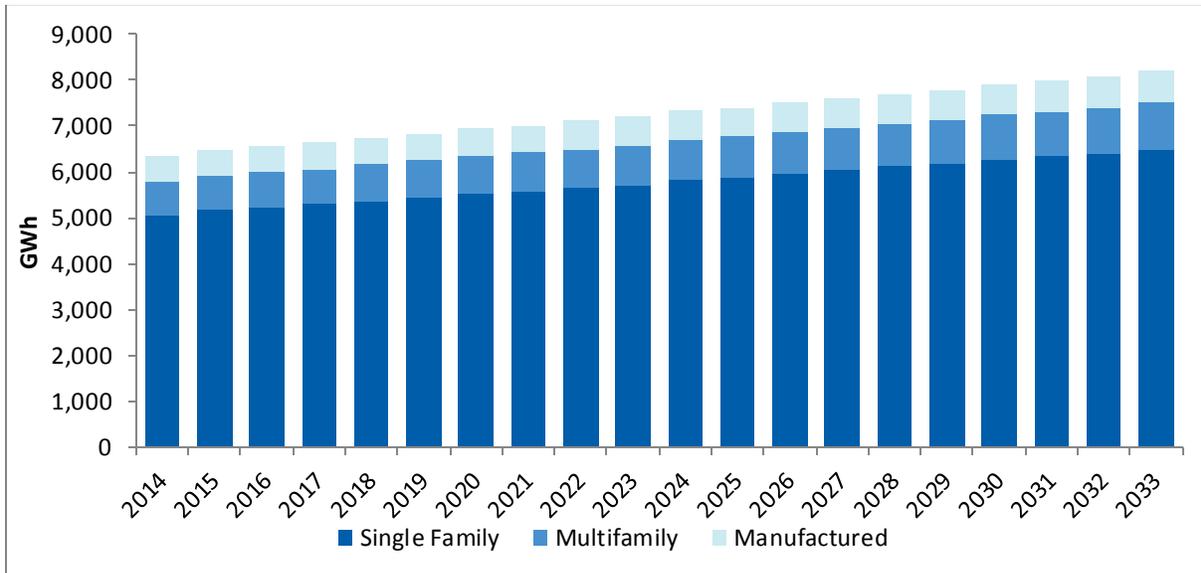


Figure C28. Commercial Electric Baseline Forecast (KU) 2014-2033

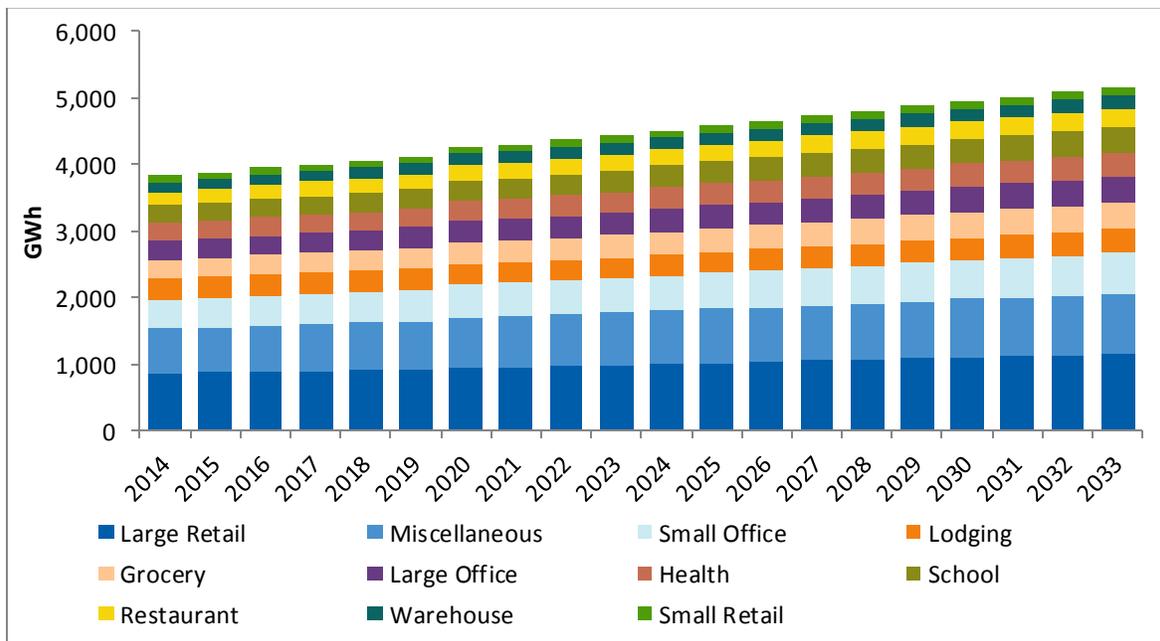


Figure C29. Residential Electric Baseline Forecast (LGE) 2014-2033

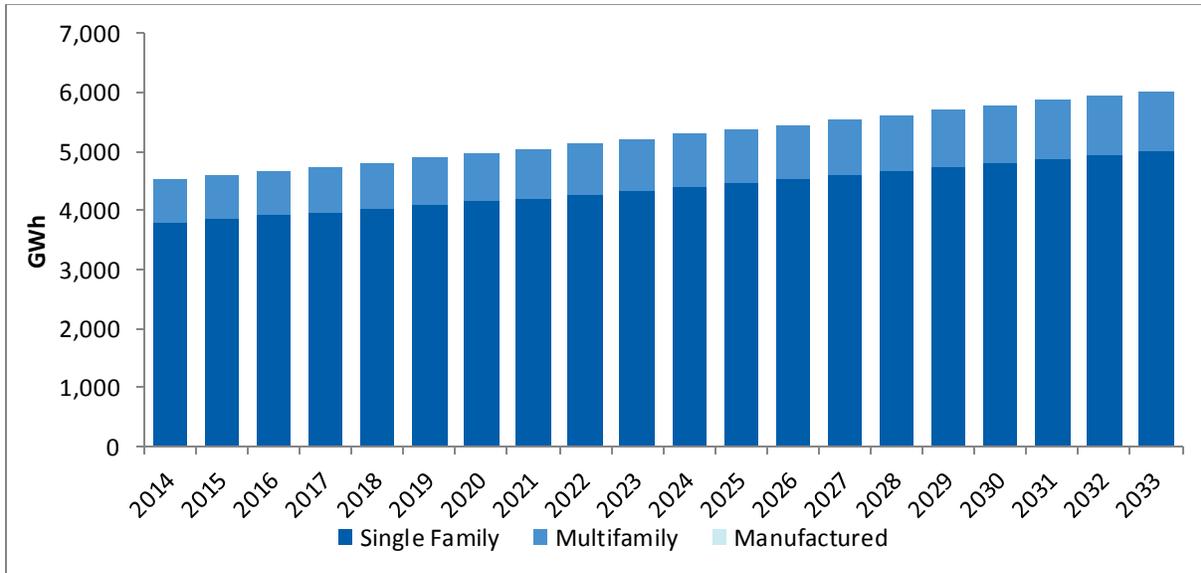


Figure C30. Residential Gas Baseline Forecast (LGE) 2014-2033

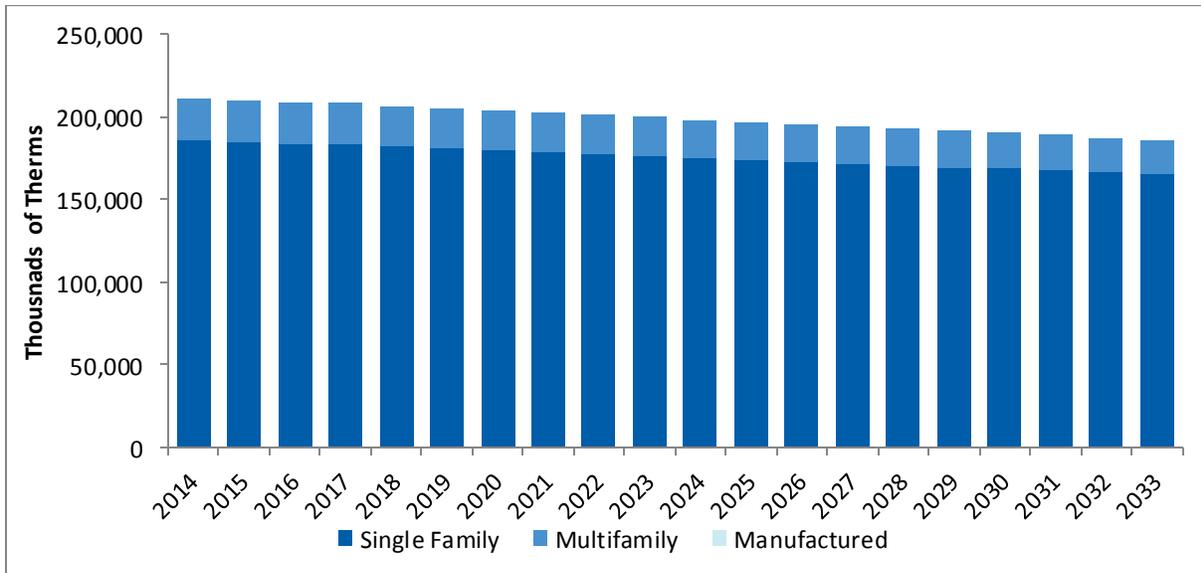


Figure C31. Commercial Electricity Baseline Forecast (LGE) 2014-2033

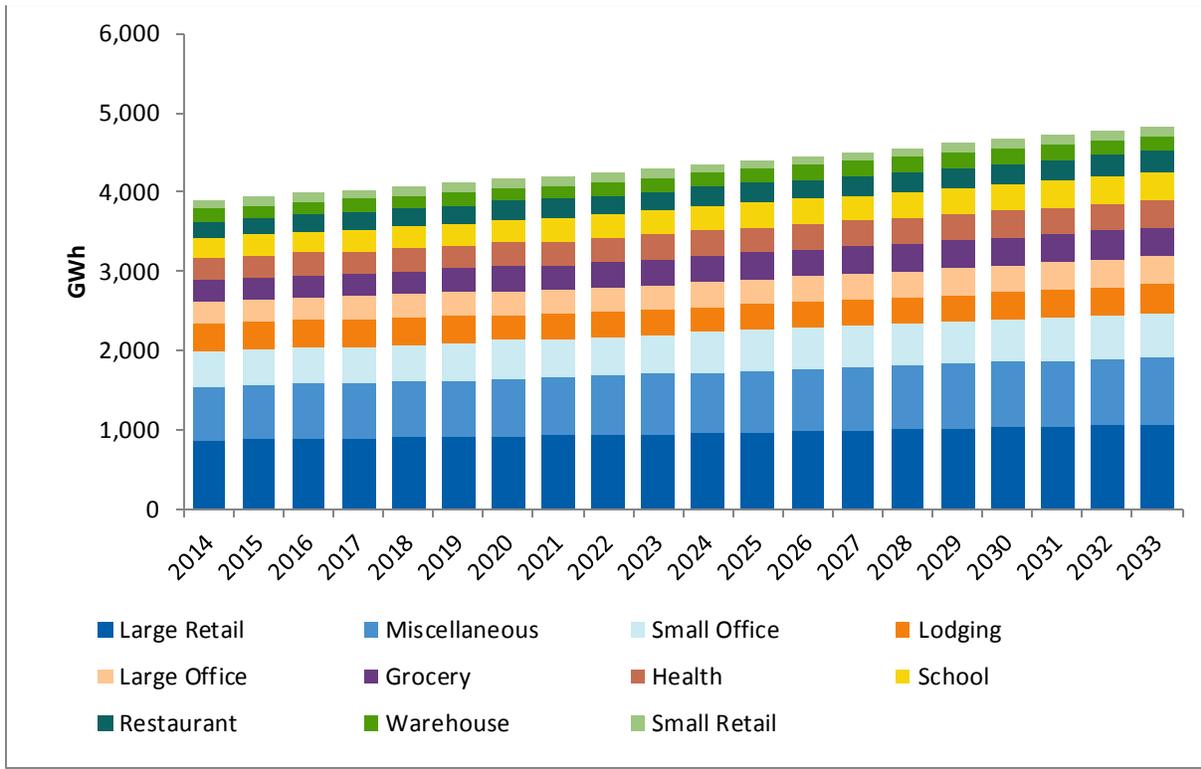


Figure C32. Commercial Gas Baseline Forecast (LGE) 2014-2033

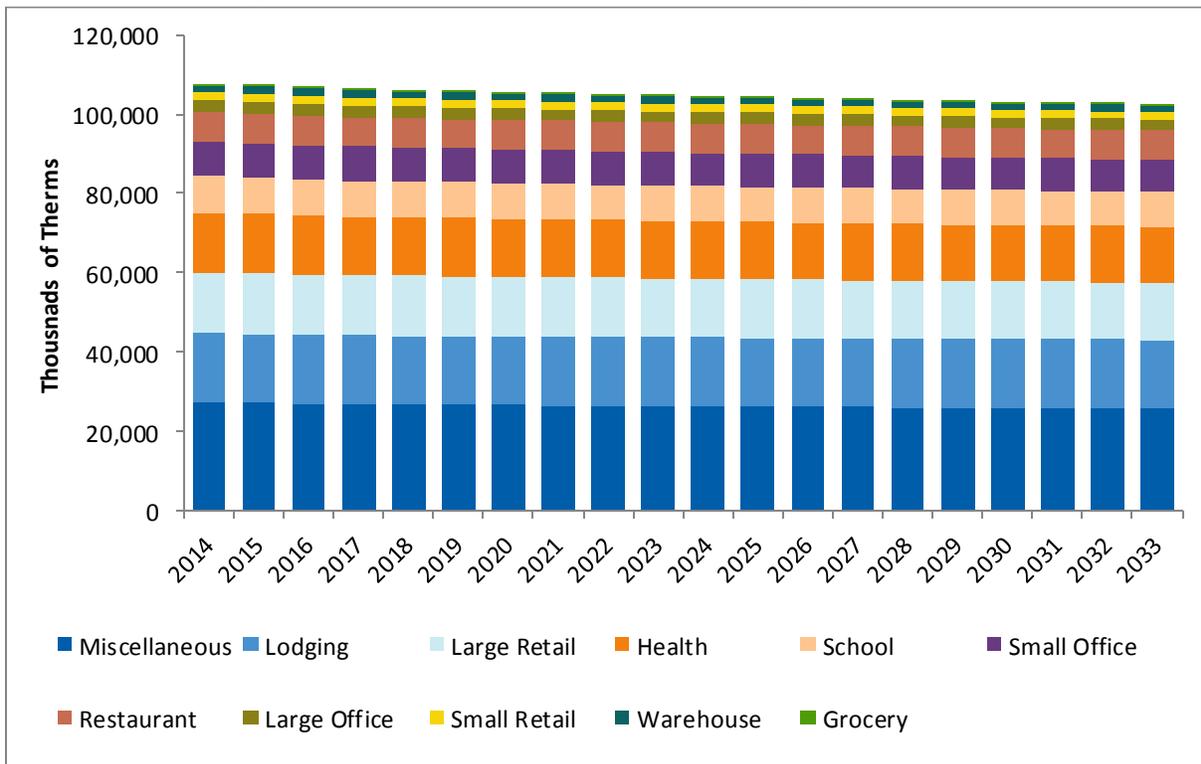


Table C3. Residential Electric (KU) Saturations, Fuel Shares, and UECs

Segment	End Use	Saturation	Fuel Share	Weighted Average UEC (2013) Existing	Weighted Average UEC (2013) New
Manufactured	Computer	0.92	1.00	194	197
Manufactured	Cooking Oven	0.92	0.90	105	105
Manufactured	Cooking Range	0.92	0.90	53	53
Manufactured	Cool Central	0.63	1.00	1,781	1,046
Manufactured	Cool Room	0.34	1.00	314	314
Manufactured	Copier	0.14	1.00	146	151
Manufactured	Dehumidifier	0.09	1.00	851	851
Manufactured	Dryer	0.88	0.98	654	654
Manufactured	DVD	0.80	1.00	20	21
Manufactured	Freezer	0.39	1.00	340	340
Manufactured	Heat Central	0.55	0.84	9,353	6,619
Manufactured	Heat Pump	0.24	1.00	8,227	6,467
Manufactured	Heat Room	0.00	1.00	7,107	5,029
Manufactured	Home Audio System	0.92	1.00	102	105
Manufactured	Lighting Interior Specialty	3.59	1.00	34	34
Manufactured	Lighting Standard	20.34	1.00	30	30
Manufactured	Monitor	0.66	1.00	57	58
Manufactured	Multifunction Device	0.92	1.00	180	141
Manufactured	Plug Load Other	0.92	1.00	687	687
Manufactured	Printer	0.00	1.00	162	141
Manufactured	Refrigerator	1.01	1.00	501	499
Manufactured	Set Top Box	1.15	1.00	199	184
Manufactured	TV	1.95	1.00	186	166
Manufactured	Ventilation and Circulation	0.55	1.00	565	565
Manufactured	Water Heat GT 55 Gal	0.12	0.98	3,264	3,264
Manufactured	Water Heat LE 55 Gal	0.80	0.98	3,001	2,899
Multifamily	Computer	1.10	1.00	194	197
Multifamily	Cooking Oven	0.92	0.94	105	105
Multifamily	Cooking Range	0.92	0.94	53	53
Multifamily	Cool Central	0.77	1.00	1,212	829
Multifamily	Cool Room	0.18	1.00	314	314
Multifamily	Copier	0.05	1.00	146	151
Multifamily	Dehumidifier	0.14	1.00	851	851
Multifamily	Dryer	0.62	0.96	501	501

Multifamily	DVD	0.98	1.00	20	21
Multifamily	Freezer	0.18	1.00	340	340
Multifamily	Heat Central	0.60	0.57	6,292	4,380
Multifamily	Heat Pump	0.23	1.00	5,176	4,180
Multifamily	Heat Room	0.05	1.00	4,781	3,328
Multifamily	Home Audio System	1.00	1.00	102	105
Multifamily	Lighting Interior Specialty	3.59	1.00	34	34
Multifamily	Lighting Standard	20.34	1.00	31	31
Multifamily	Monitor	0.64	1.00	57	58
Multifamily	Multifunction Device	0.50	1.00	180	141
Multifamily	Plug Load Other	0.92	1.00	290	290
Multifamily	Printer	0.00	1.00	162	141
Multifamily	Refrigerator	0.95	1.00	508	506
Multifamily	Set Top Box	1.37	1.00	199	184
Multifamily	TV	1.57	1.00	186	166
Multifamily	Ventilation and Circulation	0.60	1.00	569	569
Multifamily	Water Heat GT 55 Gal	0.18	0.66	2,816	2,816
Multifamily	Water Heat LE 55 Gal	0.74	0.66	2,563	2,477
Single Family	Computer	1.44	1.00	194	197
Single Family	Cooking Oven	0.92	0.86	105	105
Single Family	Cooking Range	0.92	0.86	53	53
Single Family	Cool Central	0.73	1.00	2,268	1,354
Single Family	Cool Room	0.26	1.00	314	314
Single Family	Copier	0.11	1.00	146	151
Single Family	Dehumidifier	0.21	1.00	851	851
Single Family	Dryer	0.90	0.95	732	732
Single Family	DVD	1.26	1.00	20	21
Single Family	Freezer	0.48	1.00	340	340
Single Family	Heat Central	0.53	0.30	10,286	8,888
Single Family	Heat Pump	0.28	1.00	9,586	8,314
Single Family	Heat Room	0.02	1.00	7,816	6,753
Single Family	Home Audio System	1.02	1.00	102	105
Single Family	Lighting Interior Specialty	7.04	1.00	34	34
Single Family	Lighting Standard	39.89	1.00	30	30
Single Family	Monitor	0.94	1.00	57	58
Single Family	Multifunction Device	0.85	1.00	180	141
Single Family	Plug Load Other	0.92	1.00	731	731
Single Family	Pool Pump	0.07	1.00	1,340	1,340
Single Family	Printer	0.00	1.00	162	141

Single Family	Refrigerator	1.22	1.00	501	499
Single Family	Set Top Box	2.01	1.00	199	184
Single Family	TV	2.52	1.00	186	166
Single Family	Ventilation and Circulation	0.53	1.00	1,072	1,072
Single Family	Water Heat GT 55 Gal	0.34	0.66	3,564	3,564
Single Family	Water Heat LE 55 Gal	0.58	0.66	3,273	3,162

Table C4. Commercial Electricity (KU) Saturations, Fuel Shares and UECs

Segment	End Use	Saturation	Fuel Share	Weighted Average EUI (2013) Existing	Weighted Average EUI (2013) New
Grocery	Computers	1.00	1.00	0.09	0.09
Grocery	Cooking	0.99	0.73	0.55	0.55
Grocery	Cooling Dx Evap	0.42	1.00	1.80	1.80
Grocery	Fax	1.00	1.00	0.00	0.00
Grocery	Flat Screen Monitors	1.00	1.00	0.02	0.02
Grocery	Freezers	1.00	1.00	0.00	0.00
Grocery	Heat Pump	0.35	1.00	2.56	2.56
Grocery	Lighting Exterior	1.00	1.00	1.05	1.05
Grocery	Lighting Interior Fluorescent	1.00	1.00	7.48	0.00
Grocery	Lighting Interior Hid	1.00	1.00	1.24	0.00
Grocery	Lighting Interior Other	1.00	1.00	0.16	8.41
Grocery	Lighting Interior Screw Base	1.00	1.00	0.93	0.00
Grocery	Other Plug Load	1.00	1.00	0.55	0.39
Grocery	Photo Copiers	1.00	1.00	0.01	0.01
Grocery	Printers	1.00	1.00	0.03	0.02
Grocery	Refrigeration	1.00	1.00	26.86	21.44
Grocery	Refrigerators	1.00	1.00	0.02	0.02
Grocery	Room Cool	0.14	1.00	0.56	0.56
Grocery	Room Heat	0.00	1.00	1.76	1.76
Grocery	Servers	1.00	1.00	0.03	0.03
Grocery	Space Heat	0.67	0.54	2.54	2.54
Grocery	Vending Machines	1.00	1.00	0.21	0.21
Grocery	Ventilation And Circulation	0.65	1.00	1.42	1.42
Grocery	Water Heat Gt 55 Gal	0.40	0.58	0.10	0.10
Grocery	Water Heat Le 55 Gal	0.59	0.58	0.21	0.20
Health	Computers	1.00	1.00	0.22	0.22



Health	Cooking	0.99	0.36	0.07	0.07
Health	Cooling Chillers	0.04	1.00	2.14	2.14
Health	Cooling Dx Evap	0.39	1.00	3.56	3.56
Health	Fax	1.00	1.00	0.01	0.01
Health	Flat Screen Monitors	1.00	1.00	0.05	0.05
Health	Freezers	1.00	1.00	0.00	0.00
Health	Heat Pump	0.12	1.00	3.85	3.85
Health	Lighting Exterior	1.00	1.00	0.58	0.58
Health	Lighting Interior Fluorescent	1.00	1.00	4.78	0.00
Health	Lighting Interior Hid	1.00	1.00	0.13	0.00
Health	Lighting Interior Other	1.00	1.00	0.27	4.72
Health	Lighting Interior Screw Base	1.00	1.00	1.70	0.00
Health	Other Plug Load	1.00	1.00	0.40	0.23
Health	Photo Copiers	1.00	1.00	0.01	0.01
Health	Printers	1.00	1.00	0.04	0.03
Health	Refrigeration	1.00	1.00	0.44	0.33
Health	Refrigerators	1.00	1.00	0.04	0.04
Health	Room Cool	0.00	1.00	0.07	0.07
Health	Room Heat	0.00	1.00	0.20	0.20
Health	Servers	1.00	1.00	0.02	0.02
Health	Space Heat	0.90	0.31	0.40	0.40
Health	Vending Machines	1.00	1.00	0.11	0.11
Health	Ventilation And Circulation	0.88	1.00	4.39	4.39
Health	Water Heat Gt 55 Gal	0.40	0.58	0.16	0.16
Health	Water Heat Le 55 Gal	0.59	0.58	0.33	0.32
Large Office	Computers	1.00	1.00	0.53	0.54
Large Office	Cooling Chillers	0.00	1.00	2.30	2.30
Large Office	Cooling Dx Evap	0.41	1.00	4.84	4.84
Large Office	Fax	1.00	1.00	0.01	0.01
Large Office	Flat Screen Monitors	1.00	1.00	0.11	0.11
Large Office	Freezers	1.00	1.00	0.00	0.00
Large Office	Heat Pump	0.35	1.00	5.07	5.07
Large Office	Lighting Exterior	1.00	1.00	0.51	0.51
Large Office	Lighting Interior Fluorescent	1.00	1.00	3.13	0.00
Large Office	Lighting Interior Hid	1.00	1.00	0.14	0.00
Large Office	Lighting Interior Other	1.00	1.00	0.04	3.01
Large Office	Lighting Interior Screw Base	1.00	1.00	0.44	0.00
Large Office	Other Plug Load	1.00	1.00	1.47	0.98
Large Office	Photo Copiers	1.00	1.00	0.01	0.01

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Large Office	Printers	1.00	1.00	0.10	0.09
Large Office	Refrigerators	1.00	1.00	0.03	0.03
Large Office	Room Cool	0.10	1.00	0.03	0.03
Large Office	Room Heat	0.03	1.00	0.51	0.51
Large Office	Servers	1.00	1.00	0.05	0.05
Large Office	Space Heat	0.64	0.47	0.75	0.75
Large Office	Vending Machines	1.00	1.00	0.09	0.09
Large Office	Ventilation And Circulation	0.62	1.00	2.38	2.38
Large Office	Water Heat Gt 55 Gal	0.35	0.52	0.11	0.11
Large Office	Water Heat Le 55 Gal	0.64	0.52	0.23	0.22
Large Retail	Computers	1.00	1.00	0.06	0.06
Large Retail	Cooking	0.99	0.82	0.06	0.06
Large Retail	Cooling Dx Evap	0.61	1.00	5.41	5.41
Large Retail	Fax	1.00	1.00	0.00	0.00
Large Retail	Flat Screen Monitors	1.00	1.00	0.01	0.01
Large Retail	Freezers	1.00	1.00	0.00	0.00
Large Retail	Heat Pump	0.10	1.00	5.58	5.58
Large Retail	Lighting Exterior	1.00	1.00	1.11	1.11
Large Retail	Lighting Interior Fluorescent	1.00	1.00	5.30	0.00
Large Retail	Lighting Interior Hid	1.00	1.00	1.14	0.00
Large Retail	Lighting Interior Other	1.00	1.00	0.24	7.01
Large Retail	Lighting Interior Screw Base	1.00	1.00	1.47	0.00
Large Retail	Other Plug Load	1.00	1.00	0.28	0.19
Large Retail	Photo Copiers	1.00	1.00	0.00	0.00
Large Retail	Printers	1.00	1.00	0.01	0.01
Large Retail	Refrigerators	1.00	1.00	0.00	0.00
Large Retail	Room Cool	0.20	1.00	0.05	0.05
Large Retail	Room Heat	0.00	1.00	0.14	0.14
Large Retail	Servers	1.00	1.00	0.02	0.02
Large Retail	Space Heat	0.92	0.25	0.55	0.55
Large Retail	Vending Machines	1.00	1.00	0.05	0.05
Large Retail	Ventilation And Circulation	0.90	1.00	2.28	2.28
Large Retail	Water Heat Gt 55 Gal	0.21	0.67	0.24	0.24
Large Retail	Water Heat Le 55 Gal	0.78	0.67	0.51	0.50
Lodging	Computers	1.00	1.00	0.05	0.05
Lodging	Cooking	0.99	0.67	0.13	0.13
Lodging	Cooling Chillers	0.19	1.00	0.96	0.96
Lodging	Cooling Dx Evap	0.14	1.00	1.43	1.43
Lodging	Fax	1.00	1.00	0.00	0.00



Lodging	Flat Screen Monitors	1.00	1.00	0.01	0.01
Lodging	Freezers	1.00	1.00	0.01	0.01
Lodging	Heat Pump	0.10	1.00	1.71	1.71
Lodging	Lighting Exterior	1.00	1.00	0.66	0.66
Lodging	Lighting Interior Fluorescent	1.00	1.00	1.07	0.00
Lodging	Lighting Interior Hid	1.00	1.00	0.05	0.00
Lodging	Lighting Interior Other	1.00	1.00	0.04	2.55
Lodging	Lighting Interior Screw Base	1.00	1.00	3.04	0.00
Lodging	Other Plug Load	1.00	1.00	0.46	0.35
Lodging	Package Terminal AC	0.72	1.00	0.10	0.10
Lodging	Package Terminal HP	0.42	1.00	2.01	2.01
Lodging	Photo Copiers	1.00	1.00	0.00	0.00
Lodging	Pool Pump	0.50	1.00	0.58	0.58
Lodging	Printers	1.00	1.00	0.01	0.01
Lodging	Refrigeration	1.00	1.00	0.69	0.50
Lodging	Refrigerators	1.00	1.00	0.08	0.08
Lodging	Room Cool	0.00	1.00	0.11	0.11
Lodging	Room Heat	0.00	1.00	0.42	0.42
Lodging	Servers	1.00	1.00	0.00	0.00
Lodging	Space Heat	0.44	0.54	0.90	0.90
Lodging	Vending Machines	1.00	1.00	0.23	0.22
Lodging	Ventilation And Circulation	0.43	1.00	0.36	0.36
Lodging	Water Heat Gt 55 Gal	0.40	0.58	0.40	0.40
Lodging	Water Heat Le 55 Gal	0.59	0.58	0.86	0.83
Miscellaneous	Computers	1.00	1.00	0.10	0.11
Miscellaneous	Cooking	0.99	0.55	0.01	0.01
Miscellaneous	Cooling Chillers	0.00	1.00	1.03	1.03
Miscellaneous	Cooling Dx Evap	0.29	1.00	1.52	1.52
Miscellaneous	Fax	1.00	1.00	0.01	0.01
Miscellaneous	Flat Screen Monitors	1.00	1.00	0.02	0.02
Miscellaneous	Freezers	1.00	1.00	0.01	0.01
Miscellaneous	Heat Pump	0.23	1.00	1.64	1.64
Miscellaneous	Lighting Exterior	1.00	1.00	1.23	1.23
Miscellaneous	Lighting Interior Fluorescent	1.00	1.00	2.67	0.00
Miscellaneous	Lighting Interior Hid	1.00	1.00	1.14	0.00
Miscellaneous	Lighting Interior Other	1.00	1.00	0.13	3.76
Miscellaneous	Lighting Interior Screw Base	1.00	1.00	0.71	0.00
Miscellaneous	Other Plug Load	1.00	1.00	0.13	0.06
Miscellaneous	Package Terminal AC	0.20	1.00	0.17	0.17

Miscellaneous	Package Terminal HP	0.09	1.00	1.95	1.95
Miscellaneous	Photo Copiers	1.00	1.00	0.01	0.01
Miscellaneous	Pool Pump	0.25	1.00	1.70	1.70
Miscellaneous	Printers	1.00	1.00	0.02	0.02
Miscellaneous	Refrigeration	1.00	1.00	0.51	0.37
Miscellaneous	Refrigerators	1.00	1.00	0.05	0.05
Miscellaneous	Room Cool	0.00	1.00	0.19	0.19
Miscellaneous	Room Heat	0.02	1.00	0.18	0.18
Miscellaneous	Servers	1.00	1.00	0.01	0.01
Miscellaneous	Space Heat	0.68	0.45	0.34	0.34
Miscellaneous	Vending Machines	1.00	1.00	0.15	0.15
Miscellaneous	Ventilation And Circulation	0.66	1.00	3.01	3.01
Miscellaneous	Water Heat Gt 55 Gal	0.40	0.58	0.07	0.07
Miscellaneous	Water Heat Le 55 Gal	0.59	0.58	0.14	0.14
Restaurant	Computers	1.00	1.00	0.05	0.05
Restaurant	Cooking	0.99	0.43	3.32	3.32
Restaurant	Cooling Dx Evap	0.62	1.00	3.43	3.43
Restaurant	Fax	1.00	1.00	0.00	0.00
Restaurant	Flat Screen Monitors	1.00	1.00	0.01	0.01
Restaurant	Freezers	1.00	1.00	0.02	0.02
Restaurant	Heat Pump	0.14	1.00	3.90	3.90
Restaurant	Lighting Exterior	1.00	1.00	2.36	2.36
Restaurant	Lighting Interior Fluorescent	1.00	1.00	4.46	0.00
Restaurant	Lighting Interior Hid	1.00	1.00	0.38	0.00
Restaurant	Lighting Interior Other	1.00	1.00	0.32	7.70
Restaurant	Lighting Interior Screw Base	1.00	1.00	5.55	0.00
Restaurant	Other Plug Load	1.00	1.00	0.56	0.43
Restaurant	Photo Copiers	1.00	1.00	0.00	0.00
Restaurant	Printers	1.00	1.00	0.01	0.01
Restaurant	Refrigeration	1.00	1.00	14.45	11.55
Restaurant	Refrigerators	1.00	1.00	0.14	0.14
Restaurant	Room Cool	0.00	1.00	0.35	0.35
Restaurant	Room Heat	0.03	1.00	0.97	0.97
Restaurant	Servers	1.00	1.00	0.01	0.01
Restaurant	Space Heat	0.85	0.44	1.43	1.43
Restaurant	Vending Machines	1.00	1.00	0.05	0.05
Restaurant	Ventilation And Circulation	0.83	1.00	2.64	2.64
Restaurant	Water Heat Gt 55 Gal	0.50	0.45	1.24	1.24
Restaurant	Water Heat Le 55 Gal	0.48	0.45	2.64	2.56

School	Computers	1.00	1.00	0.34	0.35
School	Cooking	0.99	0.58	0.05	0.05
School	Cooling Chillers	0.07	1.00	0.80	0.80
School	Cooling Dx Evap	0.35	1.00	1.33	1.33
School	Fax	1.00	1.00	0.00	0.00
School	Flat Screen Monitors	1.00	1.00	0.07	0.07
School	Freezers	1.00	1.00	0.01	0.01
School	Heat Pump	0.23	1.00	1.50	1.50
School	Lighting Exterior	1.00	1.00	0.76	0.76
School	Lighting Interior Fluorescent	1.00	1.00	3.15	0.00
School	Lighting Interior Hid	1.00	1.00	0.37	0.00
School	Lighting Interior Other	1.00	1.00	0.02	3.08
School	Lighting Interior Screw Base	1.00	1.00	0.13	0.00
School	Other Plug Load	1.00	1.00	0.98	0.66
School	Photo Copiers	1.00	1.00	0.01	0.01
School	Pool Pump	0.05	1.00	0.58	0.58
School	Printers	1.00	1.00	0.03	0.03
School	Refrigeration	1.00	1.00	0.30	0.20
School	Refrigerators	1.00	1.00	0.05	0.05
School	Room Cool	0.17	1.00	0.03	0.03
School	Room Heat	0.00	1.00	0.13	0.13
School	Servers	1.00	1.00	0.02	0.02
School	Space Heat	0.79	0.54	0.35	0.35
School	Vending Machines	1.00	1.00	0.20	0.20
School	Ventilation And Circulation	0.77	1.00	2.60	2.60
School	Water Heat Gt 55 Gal	0.40	0.58	0.24	0.24
School	Water Heat Le 55 Gal	0.59	0.58	0.51	0.49
Small Office	Computers	1.00	1.00	0.49	0.50
Small Office	Cooling Dx Evap	0.44	1.00	1.81	1.81
Small Office	Fax	1.00	1.00	0.02	0.02
Small Office	Flat Screen Monitors	1.00	1.00	0.10	0.10
Small Office	Freezers	1.00	1.00	0.01	0.01
Small Office	Heat Pump	0.36	1.00	2.08	2.08
Small Office	Lighting Exterior	1.00	1.00	1.28	1.28
Small Office	Lighting Interior Fluorescent	1.00	1.00	3.13	0.00
Small Office	Lighting Interior Hid	1.00	1.00	0.14	0.00
Small Office	Lighting Interior Other	1.00	1.00	0.04	3.01
Small Office	Lighting Interior Screw Base	1.00	1.00	0.44	0.00
Small Office	Other Plug Load	1.00	1.00	1.28	0.82

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Small Office	Photo Copiers	1.00	1.00	0.03	0.03
Small Office	Printers	1.00	1.00	0.07	0.06
Small Office	Refrigerators	1.00	1.00	0.07	0.07
Small Office	Room Cool	0.17	1.00	0.26	0.26
Small Office	Room Heat	0.07	1.00	0.51	0.51
Small Office	Servers	1.00	1.00	0.09	0.08
Small Office	Space Heat	0.58	0.50	0.81	0.81
Small Office	Vending Machines	1.00	1.00	0.21	0.20
Small Office	Ventilation And Circulation	0.57	1.00	0.91	0.91
Small Office	Water Heat Gt 55 Gal	0.05	0.55	0.07	0.07
Small Office	Water Heat Le 55 Gal	0.93	0.55	0.15	0.14
Small Retail	Computers	1.00	1.00	0.09	0.10
Small Retail	Cooling Dx Evap	0.45	1.00	0.78	0.78
Small Retail	Fax	1.00	1.00	0.01	0.01
Small Retail	Flat Screen Monitors	1.00	1.00	0.02	0.02
Small Retail	Freezers	1.00	1.00	0.01	0.01
Small Retail	Heat Pump	0.12	1.00	0.85	0.85
Small Retail	Lighting Exterior	1.00	1.00	1.11	1.11
Small Retail	Lighting Interior Fluorescent	1.00	1.00	5.30	0.00
Small Retail	Lighting Interior Hid	1.00	1.00	1.14	0.00
Small Retail	Lighting Interior Other	1.00	1.00	0.24	7.01
Small Retail	Lighting Interior Screw Base	1.00	1.00	1.47	0.00
Small Retail	Other Plug Load	1.00	1.00	0.18	0.10
Small Retail	Photo Copiers	1.00	1.00	0.01	0.01
Small Retail	Printers	1.00	1.00	0.02	0.02
Small Retail	Refrigerators	1.00	1.00	0.05	0.05
Small Retail	Room Cool	0.28	1.00	0.35	0.35
Small Retail	Room Heat	0.12	1.00	0.13	0.13
Small Retail	Servers	1.00	1.00	0.02	0.02
Small Retail	Space Heat	0.78	0.31	0.20	0.20
Small Retail	Vending Machines	1.00	1.00	0.25	0.25
Small Retail	Ventilation And Circulation	0.76	1.00	0.32	0.32
Small Retail	Water Heat Gt 55 Gal	0.16	0.72	0.03	0.03
Small Retail	Water Heat Le 55 Gal	0.83	0.72	0.06	0.06
Warehouse	Computers	1.00	1.00	0.04	0.04
Warehouse	Cooling Chillers	0.00	1.00	0.24	0.24
Warehouse	Cooling Dx Evap	0.26	1.00	0.36	0.36
Warehouse	Fax	1.00	1.00	0.00	0.00
Warehouse	Flat Screen Monitors	1.00	1.00	0.01	0.01

Warehouse	Freezers	1.00	1.00	0.00	0.00
Warehouse	Heat Pump	0.14	1.00	0.41	0.41
Warehouse	Lighting Exterior	1.00	1.00	0.28	0.28
Warehouse	Lighting Interior Fluorescent	1.00	1.00	1.46	0.00
Warehouse	Lighting Interior Hid	1.00	1.00	1.50	0.00
Warehouse	Lighting Interior Other	1.00	1.00	0.01	2.75
Warehouse	Lighting Interior Screw Base	1.00	1.00	0.59	0.00
Warehouse	Other Plug Load	1.00	1.00	0.06	0.03
Warehouse	Photo Copiers	1.00	1.00	0.00	0.00
Warehouse	Printers	1.00	1.00	0.01	0.01
Warehouse	Refrigeration	1.00	1.00	1.93	1.54
Warehouse	Refrigerators	1.00	1.00	0.01	0.01
Warehouse	Room Cool	0.31	1.00	0.08	0.08
Warehouse	Room Heat	0.11	1.00	0.08	0.08
Warehouse	Servers	1.00	1.00	0.02	0.02
Warehouse	Space Heat	0.77	0.38	0.15	0.15
Warehouse	Vending Machines	1.00	1.00	0.05	0.05
Warehouse	Ventilation And Circulation	0.76	1.00	0.31	0.31
Warehouse	Water Heat Gt 55 Gal	0.40	0.58	0.02	0.02
Warehouse	Water Heat Le 55 Gal	0.59	0.58	0.03	0.03

Table C5. Residential Electric (LGE) Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Fuel Share	Weighted Average UEC (2013) Existing	Weighted Average UEC (2013) New
Multifamily	Computer	1.61	1.00	194	197
Multifamily	Cooking Oven	0.98	0.85	105	105
Multifamily	Cooking Range	0.98	0.85	53	53
Multifamily	Cool Central	0.87	1.00	1,479	1,012
Multifamily	Cool Room	0.13	1.00	384	384
Multifamily	Copier	0.05	1.00	146	151
Multifamily	Dehumidifier	0.07	1.00	851	851
Multifamily	Dryer	0.71	0.93	576	576
Multifamily	DVD	1.04	1.00	20	21
Multifamily	Freezer	0.17	1.00	340	340
Multifamily	Heat Central	0.83	0.40	5,863	4,081

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Multifamily	Heat Pump	0.09	1.00	5,168	4,127
Multifamily	Heat Room	0.00	1.00	4,455	3,101
Multifamily	Home Audio System	1.22	1.00	102	105
Multifamily	Lighting Interior Specialty	3.81	1.00	34	34
Multifamily	Lighting Standard	21.57	1.00	31	31
Multifamily	Monitor	0.77	1.00	57	58
Multifamily	Multifunction Device	0.53	1.00	180	141
Multifamily	Plug Load Other	0.98	1.00	290	290
Multifamily	Printer	0.00	1.00	162	141
Multifamily	Refrigerator	1.10	1.00	506	505
Multifamily	Set Top Box	1.44	1.00	199	184
Multifamily	TV	2.07	1.00	186	166
Multifamily	Ventilation and Circulation	0.83	1.00	508	508
Multifamily	Water Heat GT 55 Gal	0.29	0.43	2,919	2,919
Multifamily	Water Heat LE 55 Gal	0.69	0.43	2,679	2,588
Single Family	Computer	1.97	1.00	194	197
Single Family	Cooking Oven	0.98	0.67	105	105
Single Family	Cooking Range	0.98	0.67	53	53
Single Family	Cool Central	1.01	1.00	2,769	1,653
Single Family	Cool Room	0.16	1.00	384	384
Single Family	Copier	0.12	1.00	146	151
Single Family	Dehumidifier	0.27	1.00	851	851
Single Family	Dryer	0.95	0.81	772	771
Single Family	DVD	1.33	1.00	20	21
Single Family	Freezer	0.42	1.00	340	340
Single Family	Heat Central	0.86	0.09	9,584	8,282
Single Family	Heat Pump	0.10	1.00	9,578	8,126
Single Family	Heat Room	0.00	1.00	7,283	6,293
Single Family	Home Audio System	1.27	1.00	102	105
Single Family	Lighting Interior Specialty	7.47	1.00	34	34
Single Family	Lighting Standard	42.31	1.00	29	29
Single Family	Monitor	1.05	1.00	57	58
Single Family	Multifunction Device	0.91	1.00	180	141
Single Family	Plug Load Other	0.98	1.00	731	731
Single Family	Pool Pump	0.08	1.00	1,340	1,340
Single Family	Printer	0.00	1.00	162	141
Single Family	Refrigerator	1.38	1.00	498	496
Single Family	Set Top Box	1.98	1.00	199	184
Single Family	TV	3.10	1.00	186	166

Single Family	Ventilation and Circulation	0.86	1.00	848	848
Single Family	Water Heat GT 55 Gal	0.39	0.24	3,567	3,567
Single Family	Water Heat LE 55 Gal	0.59	0.24	3,313	3,198

Table C6. Residential Gas (LGE) Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Fuel Share	Weighted Average UEC (2013) Existing	Weighted Average UEC (2013) New
Multifamily	Cooking Oven	0.91	0.15	22	22
Multifamily	Cooking Range	0.91	0.15	24	24
Multifamily	Dryer	0.66	0.06	17	17
Multifamily	Heat Central Boiler	0.00	1.00	550	452
Multifamily	Heat Central Furnace	0.85	0.60	343	244
Multifamily	Water Heat GT 55 Gal	0.30	0.51	117	117
Multifamily	Water Heat LE 55 Gal	0.70	0.51	140	140
Single Family	Cooking Oven	0.91	0.31	22	22
Single Family	Cooking Range	0.91	0.31	24	24
Single Family	Dryer	0.88	0.19	22	22
Single Family	Heat Central Boiler	0.00	1.00	767	704
Single Family	Heat Central Furnace	0.87	0.91	606	525
Single Family	Pool Heat	0.03	1.00	257	257
Single Family	Water Heat GT 55 Gal	0.40	0.75	145	145
Single Family	Water Heat LE 55 Gal	0.60	0.75	173	173

Table C5. Commercial Electric (LGE) Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Fuel Share	Weighted Average EUI (2013) Existing	Weighted Average EUI (2013) New
Grocery	Computers	1.00	1.00	0.09	0.09
Grocery	Cooking	0.99	0.67	0.55	0.55
Grocery	Cooling Dx Evap	0.73	1.00	1.79	1.79
Grocery	Fax	1.00	1.00	0.00	0.00
Grocery	Flat Screen Monitors	1.00	1.00	0.02	0.02

Grocery	Freezers	1.00	1.00	0.00	0.00
Grocery	Heat Pump	0.18	1.00	2.56	2.56
Grocery	Lighting Exterior	1.01	1.00	1.05	1.05
Grocery	Lighting Interior Fluorescent	1.01	1.00	7.48	0.00
Grocery	Lighting Interior Hid	1.01	1.00	1.24	0.00
Grocery	Lighting Interior Other	1.01	1.00	0.16	8.41
Grocery	Lighting Interior Screw Base	1.01	1.00	1.49	0.00
Grocery	Other Plug Load	1.00	1.00	0.55	0.39
Grocery	Photo Copiers	1.00	1.00	0.01	0.01
Grocery	Printers	1.00	1.00	0.03	0.02
Grocery	Refrigeration	1.01	1.00	26.86	21.44
Grocery	Refrigerators	1.00	1.00	0.02	0.02
Grocery	Room Cool	0.00	1.00	0.72	0.72
Grocery	Room Heat	0.09	1.00	1.76	1.76
Grocery	Servers	1.00	1.00	0.03	0.03
Grocery	Space Heat	0.73	0.40	2.54	2.54
Grocery	Vending Machines	1.00	1.00	0.21	0.21
Grocery	Ventilation And Circulation	0.73	1.00	1.42	1.42
Grocery	Water Heat Gt 55 Gal	0.40	0.58	0.10	0.10
Grocery	Water Heat Le 55 Gal	0.59	0.58	0.21	0.20
Health	Computers	1.00	1.00	0.22	0.22
Health	Cooking	0.99	0.26	0.07	0.07
Health	Cooling Chillers	0.46	1.00	2.16	2.16
Health	Cooling Dx Evap	0.36	1.00	3.55	3.55
Health	Fax	1.00	1.00	0.01	0.01
Health	Flat Screen Monitors	1.00	1.00	0.05	0.05
Health	Freezers	1.00	1.00	0.00	0.00
Health	Heat Pump	0.00	1.00	3.85	3.85
Health	Lighting Exterior	1.01	1.00	0.58	0.58
Health	Lighting Interior Fluorescent	1.01	1.00	4.83	0.00
Health	Lighting Interior Hid	1.01	1.00	0.13	0.00
Health	Lighting Interior Other	1.01	1.00	0.27	4.72
Health	Lighting Interior Screw Base	1.01	1.00	2.30	0.00
Health	Other Plug Load	1.00	1.00	3.32	2.57
Health	Photo Copiers	1.00	1.00	0.01	0.01
Health	Printers	1.00	1.00	0.04	0.03
Health	Refrigeration	1.01	1.00	0.44	0.33
Health	Refrigerators	1.00	1.00	0.04	0.04
Health	Room Cool	0.19	1.00	0.09	0.09

Health	Room Heat	0.06	1.00	0.20	0.20
Health	Servers	1.00	1.00	0.02	0.02
Health	Space Heat	0.95	0.33	0.40	0.40
Health	Vending Machines	1.00	1.00	0.11	0.11
Health	Ventilation And Circulation	0.94	1.00	4.39	4.39
Health	Water Heat Gt 55 Gal	0.40	0.58	0.16	0.16
Health	Water Heat Le 55 Gal	0.59	0.58	0.33	0.32
Large Office	Computers	1.00	1.00	0.53	0.54
Large Office	Cooling Chillers	0.38	1.00	2.32	2.32
Large Office	Cooling Dx Evap	0.42	1.00	4.83	4.83
Large Office	Fax	1.00	1.00	0.01	0.01
Large Office	Flat Screen Monitors	1.00	1.00	0.11	0.11
Large Office	Freezers	1.00	1.00	0.00	0.00
Large Office	Heat Pump	0.04	1.00	5.07	5.07
Large Office	Lighting Exterior	1.01	1.00	0.51	0.51
Large Office	Lighting Interior Fluorescent	1.01	1.00	3.01	0.00
Large Office	Lighting Interior Hid	1.01	1.00	0.14	0.00
Large Office	Lighting Interior Other	1.01	1.00	0.04	3.01
Large Office	Lighting Interior Screw Base	1.01	1.00	0.71	0.00
Large Office	Other Plug Load	1.00	1.00	1.47	0.98
Large Office	Photo Copiers	1.00	1.00	0.01	0.01
Large Office	Printers	1.00	1.00	0.10	0.09
Large Office	Refrigerators	1.00	1.00	0.03	0.03
Large Office	Room Cool	0.07	1.00	0.03	0.03
Large Office	Room Heat	0.00	1.00	0.51	0.51
Large Office	Servers	1.00	1.00	0.05	0.05
Large Office	Space Heat	0.97	0.12	0.75	0.75
Large Office	Vending Machines	1.00	1.00	0.09	0.09
Large Office	Ventilation And Circulation	0.96	1.00	2.38	2.38
Large Office	Water Heat Gt 55 Gal	0.35	0.52	0.11	0.11
Large Office	Water Heat Le 55 Gal	0.64	0.52	0.23	0.22
Large Retail	Computers	1.00	1.00	0.06	0.06
Large Retail	Cooking	0.99	0.42	0.06	0.06
Large Retail	Cooling Dx Evap	0.67	1.00	5.40	5.40
Large Retail	Fax	1.00	1.00	0.00	0.00
Large Retail	Flat Screen Monitors	1.00	1.00	0.01	0.01
Large Retail	Freezers	1.00	1.00	0.00	0.00
Large Retail	Heat Pump	0.00	1.00	5.58	5.58
Large Retail	Lighting Exterior	1.01	1.00	1.11	1.11

Large Retail	Lighting Interior Fluorescent	1.01	1.00	5.23	0.00
Large Retail	Lighting Interior Hid	1.01	1.00	1.14	0.00
Large Retail	Lighting Interior Other	1.01	1.00	0.24	7.01
Large Retail	Lighting Interior Screw Base	1.01	1.00	2.21	0.00
Large Retail	Other Plug Load	1.00	1.00	0.28	0.19
Large Retail	Photo Copiers	1.00	1.00	0.00	0.00
Large Retail	Printers	1.00	1.00	0.01	0.01
Large Retail	Refrigerators	1.00	1.00	0.00	0.00
Large Retail	Room Cool	0.06	1.00	0.06	0.06
Large Retail	Room Heat	0.00	1.00	0.14	0.14
Large Retail	Servers	1.00	1.00	0.02	0.02
Large Retail	Space Heat	1.00	0.18	0.55	0.55
Large Retail	Vending Machines	1.00	1.00	0.05	0.05
Large Retail	Ventilation And Circulation	1.00	1.00	2.28	2.28
Large Retail	Water Heat Gt 55 Gal	0.21	0.67	0.24	0.24
Large Retail	Water Heat Le 55 Gal	0.78	0.67	0.51	0.50
Lodging	Computers	1.00	1.00	0.05	0.05
Lodging	Cooking	0.99	0.50	0.13	0.13
Lodging	Cooling Chillers	0.08	1.00	0.98	0.98
Lodging	Cooling Dx Evap	0.17	1.00	1.42	1.42
Lodging	Fax	1.00	1.00	0.00	0.00
Lodging	Flat Screen Monitors	1.00	1.00	0.01	0.01
Lodging	Freezers	1.00	1.00	0.01	0.01
Lodging	Heat Pump	0.08	1.00	1.71	1.71
Lodging	Lighting Exterior	1.01	1.00	0.66	0.66
Lodging	Lighting Interior Fluorescent	1.01	1.00	1.07	0.00
Lodging	Lighting Interior Hid	1.01	1.00	0.05	0.00
Lodging	Lighting Interior Other	1.01	1.00	0.04	2.55
Lodging	Lighting Interior Screw Base	1.01	1.00	4.86	0.00
Lodging	Other Plug Load	1.00	1.00	0.46	0.35
Lodging	Package Terminal AC	0.67	1.00	0.13	0.13
Lodging	Package Terminal HP	0.42	1.00	2.01	2.01
Lodging	Photo Copiers	1.00	1.00	0.00	0.00
Lodging	Pool Pump	0.50	1.00	0.58	0.58
Lodging	Printers	1.00	1.00	0.01	0.01
Lodging	Refrigeration	1.01	1.00	0.69	0.50
Lodging	Refrigerators	1.00	1.00	0.08	0.07
Lodging	Room Cool	0.00	1.00	0.14	0.14
Lodging	Room Heat	0.00	1.00	0.42	0.42

Lodging	Servers	1.00	1.00	0.00	0.00
Lodging	Space Heat	0.33	0.80	0.90	0.90
Lodging	Vending Machines	1.00	1.00	0.23	0.22
Lodging	Ventilation And Circulation	0.33	1.00	0.36	0.36
Lodging	Water Heat Gt 55 Gal	0.40	0.58	0.40	0.40
Lodging	Water Heat Le 55 Gal	0.59	0.58	0.86	0.83
Miscellaneous	Computers	1.00	1.00	0.10	0.11
Miscellaneous	Cooking	0.99	0.60	0.01	0.01
Miscellaneous	Cooling Chillers	0.19	1.00	1.05	1.05
Miscellaneous	Cooling Dx Evap	0.54	1.00	1.52	1.52
Miscellaneous	Fax	1.00	1.00	0.01	0.01
Miscellaneous	Flat Screen Monitors	1.00	1.00	0.02	0.02
Miscellaneous	Freezers	1.00	1.00	0.00	0.00
Miscellaneous	Heat Pump	0.12	1.00	1.64	1.64
Miscellaneous	Lighting Exterior	1.01	1.00	1.23	1.23
Miscellaneous	Lighting Interior Fluorescent	1.01	1.00	2.66	0.00
Miscellaneous	Lighting Interior Hid	1.01	1.00	1.14	0.00
Miscellaneous	Lighting Interior Other	1.01	1.00	0.13	3.76
Miscellaneous	Lighting Interior Screw Base	1.01	1.00	1.12	0.00
Miscellaneous	Other Plug Load	1.00	1.00	0.13	0.06
Miscellaneous	Package Terminal AC	0.13	1.00	0.22	0.22
Miscellaneous	Package Terminal HP	0.07	1.00	1.95	1.95
Miscellaneous	Photo Copiers	1.00	1.00	0.01	0.01
Miscellaneous	Pool Pump	0.05	1.00	1.70	1.70
Miscellaneous	Printers	1.00	1.00	0.02	0.02
Miscellaneous	Refrigeration	1.01	1.00	0.51	0.37
Miscellaneous	Refrigerators	1.00	1.00	0.05	0.05
Miscellaneous	Room Cool	0.00	1.00	0.24	0.24
Miscellaneous	Room Heat	0.02	1.00	0.18	0.18
Miscellaneous	Servers	1.00	1.00	0.01	0.01
Miscellaneous	Space Heat	0.79	0.25	0.34	0.34
Miscellaneous	Vending Machines	1.00	1.00	0.15	0.15
Miscellaneous	Ventilation And Circulation	0.79	1.00	3.01	3.01
Miscellaneous	Water Heat Gt 55 Gal	0.40	0.58	0.07	0.07
Miscellaneous	Water Heat Le 55 Gal	0.59	0.58	0.14	0.14
Restaurant	Computers	1.00	1.00	0.05	0.05
Restaurant	Cooking	0.99	0.21	3.32	3.32
Restaurant	Cooling Dx Evap	0.78	1.00	3.42	3.42
Restaurant	Fax	1.00	1.00	0.00	0.00

Restaurant	Flat Screen Monitors	1.00	1.00	0.01	0.01
Restaurant	Freezers	1.00	1.00	0.01	0.01
Restaurant	Heat Pump	0.06	1.00	3.90	3.90
Restaurant	Lighting Exterior	1.01	1.00	2.36	2.36
Restaurant	Lighting Interior Fluorescent	1.01	1.00	4.45	0.00
Restaurant	Lighting Interior Hid	1.01	1.00	0.38	0.00
Restaurant	Lighting Interior Other	1.01	1.00	0.32	7.70
Restaurant	Lighting Interior Screw Base	1.01	1.00	6.72	0.00
Restaurant	Other Plug Load	1.00	1.00	0.56	0.43
Restaurant	Photo Copiers	1.00	1.00	0.00	0.00
Restaurant	Printers	1.00	1.00	0.01	0.01
Restaurant	Refrigeration	1.01	1.00	14.45	11.55
Restaurant	Refrigerators	1.00	1.00	0.14	0.14
Restaurant	Room Cool	0.00	1.00	0.46	0.46
Restaurant	Room Heat	0.03	1.00	0.97	0.97
Restaurant	Servers	1.00	1.00	0.01	0.01
Restaurant	Space Heat	0.96	0.40	1.43	1.43
Restaurant	Vending Machines	1.00	1.00	0.05	0.05
Restaurant	Ventilation And Circulation	0.91	1.00	2.64	2.64
Restaurant	Water Heat Gt 55 Gal	0.51	0.45	1.24	1.24
Restaurant	Water Heat Le 55 Gal	0.48	0.45	2.64	2.56
School	Computers	1.00	1.00	0.34	0.35
School	Cooking	0.99	0.17	0.05	0.05
School	Cooling Chillers	0.13	1.00	0.81	0.81
School	Cooling Dx Evap	0.76	1.00	1.33	1.33
School	Fax	1.00	1.00	0.00	0.00
School	Flat Screen Monitors	1.00	1.00	0.07	0.07
School	Freezers	1.00	1.00	0.00	0.00
School	Heat Pump	0.00	1.00	1.50	1.50
School	Lighting Exterior	1.01	1.00	0.76	0.76
School	Lighting Interior Fluorescent	1.01	1.00	3.15	0.00
School	Lighting Interior Hid	1.01	1.00	0.37	0.00
School	Lighting Interior Other	1.01	1.00	0.02	3.08
School	Lighting Interior Screw Base	1.01	1.00	0.21	0.00
School	Other Plug Load	1.00	1.00	0.98	0.66
School	Photo Copiers	1.00	1.00	0.01	0.01
School	Pool Pump	0.05	1.00	0.58	0.58
School	Printers	1.00	1.00	0.03	0.03
School	Refrigeration	1.01	1.00	0.30	0.20

School	Refrigerators	1.00	1.00	0.05	0.05
School	Room Cool	0.13	1.00	0.04	0.04
School	Room Heat	0.00	1.00	0.13	0.13
School	Servers	1.00	1.00	0.02	0.02
School	Space Heat	1.00	0.33	0.35	0.35
School	Vending Machines	1.00	1.00	0.20	0.20
School	Ventilation And Circulation	1.00	1.00	2.60	2.60
School	Water Heat Gt 55 Gal	0.40	0.58	0.24	0.24
School	Water Heat Le 55 Gal	0.59	0.58	0.51	0.49
Small Office	Computers	1.00	1.00	0.49	0.50
Small Office	Cooling Dx Evap	0.60	1.00	1.81	1.81
Small Office	Fax	1.00	1.00	0.02	0.02
Small Office	Flat Screen Monitors	1.00	1.00	0.10	0.10
Small Office	Freezers	1.00	1.00	0.01	0.01
Small Office	Heat Pump	0.08	1.00	2.08	2.08
Small Office	Lighting Exterior	1.01	1.00	1.28	1.28
Small Office	Lighting Interior Fluorescent	1.01	1.00	3.01	0.00
Small Office	Lighting Interior Hid	1.01	1.00	0.14	0.00
Small Office	Lighting Interior Other	1.01	1.00	0.04	3.01
Small Office	Lighting Interior Screw Base	1.01	1.00	0.81	0.00
Small Office	Other Plug Load	1.00	1.00	1.28	0.82
Small Office	Photo Copiers	1.00	1.00	0.03	0.03
Small Office	Printers	1.00	1.00	0.07	0.06
Small Office	Refrigerators	1.00	1.00	0.07	0.07
Small Office	Room Cool	0.16	1.00	0.34	0.34
Small Office	Room Heat	0.08	1.00	0.51	0.51
Small Office	Servers	1.00	1.00	0.09	0.08
Small Office	Space Heat	0.84	0.25	0.81	0.81
Small Office	Vending Machines	1.00	1.00	0.21	0.20
Small Office	Ventilation And Circulation	0.83	1.00	0.91	0.91
Small Office	Water Heat Gt 55 Gal	0.05	0.55	0.07	0.07
Small Office	Water Heat Le 55 Gal	0.94	0.55	0.15	0.14
Small Retail	Computers	1.00	1.00	0.09	0.10
Small Retail	Cooling Dx Evap	0.57	1.00	0.78	0.78
Small Retail	Fax	1.00	1.00	0.01	0.01
Small Retail	Flat Screen Monitors	1.00	1.00	0.02	0.02
Small Retail	Freezers	1.00	1.00	0.00	0.00
Small Retail	Heat Pump	0.00	1.00	0.85	0.85
Small Retail	Lighting Exterior	1.01	1.00	1.11	1.11

Small Retail	Lighting Interior Fluorescent	1.01	1.00	5.23	0.00
Small Retail	Lighting Interior Hid	1.01	1.00	1.14	0.00
Small Retail	Lighting Interior Other	1.01	1.00	0.24	7.01
Small Retail	Lighting Interior Screw Base	1.01	1.00	4.11	0.00
Small Retail	Other Plug Load	1.00	1.00	0.18	0.10
Small Retail	Photo Copiers	1.00	1.00	0.01	0.01
Small Retail	Printers	1.00	1.00	0.02	0.02
Small Retail	Refrigerators	1.00	1.00	0.05	0.05
Small Retail	Room Cool	0.13	1.00	0.45	0.45
Small Retail	Room Heat	0.04	1.00	0.13	0.13
Small Retail	Servers	1.00	1.00	0.02	0.02
Small Retail	Space Heat	0.96	0.30	0.20	0.20
Small Retail	Vending Machines	1.00	1.00	0.25	0.25
Small Retail	Ventilation And Circulation	0.96	1.00	0.32	0.32
Small Retail	Water Heat Gt 55 Gal	0.16	0.72	0.03	0.03
Small Retail	Water Heat Le 55 Gal	0.83	0.72	0.06	0.06
Warehouse	Computers	1.00	1.00	0.04	0.04
Warehouse	Cooling Chillers	0.14	1.00	0.25	0.25
Warehouse	Cooling Dx Evap	0.58	1.00	0.36	0.36
Warehouse	Fax	1.00	1.00	0.00	0.00
Warehouse	Flat Screen Monitors	1.00	1.00	0.01	0.01
Warehouse	Freezers	1.00	1.00	0.00	0.00
Warehouse	Heat Pump	0.06	1.00	0.41	0.41
Warehouse	Lighting Exterior	1.01	1.00	0.28	0.28
Warehouse	Lighting Interior Fluorescent	1.01	1.00	1.46	0.00
Warehouse	Lighting Interior Hid	1.01	1.00	1.50	0.00
Warehouse	Lighting Interior Other	1.01	1.00	0.01	2.75
Warehouse	Lighting Interior Screw Base	1.01	1.00	0.94	0.00
Warehouse	Other Plug Load	1.00	1.00	0.06	0.03
Warehouse	Photo Copiers	1.00	1.00	0.00	0.00
Warehouse	Printers	1.00	1.00	0.01	0.01
Warehouse	Refrigeration	1.01	1.00	1.93	1.54
Warehouse	Refrigerators	1.00	1.00	0.01	0.01
Warehouse	Room Cool	0.11	1.00	0.11	0.11
Warehouse	Room Heat	0.06	1.00	0.08	0.08
Warehouse	Servers	1.00	1.00	0.02	0.02
Warehouse	Space Heat	0.88	0.04	0.15	0.15
Warehouse	Vending Machines	1.00	1.00	0.05	0.05
Warehouse	Ventilation And Circulation	0.88	1.00	0.31	0.31

Warehouse	Water Heat Gt 55 Gal	0.40	0.58	0.02	0.02
Warehouse	Water Heat Le 55 Gal	0.59	0.58	0.03	0.03

Table C6. Commercial Gas (LGE) Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Fuel Share	Weighted Average EUI (2013) Existing	Weighted Average EUI (2013) New
Grocery	Cooking	1.02	0.33	0.08	0.08
Grocery	Space Heat Boiler	0.17	1.00	0.30	0.30
Grocery	Space Heat Furnace	0.85	0.60	0.31	0.31
Grocery	Water Heat Gt 55 Gal	0.40	0.42	0.03	0.03
Grocery	Water Heat Le 55 Gal	0.59	0.42	0.03	0.03
Health	Cooking	1.02	0.74	0.03	0.03
Health	Space Heat Boiler	0.13	1.00	0.39	0.39
Health	Space Heat Furnace	0.89	0.67	0.40	0.40
Health	Water Heat Gt 55 Gal	0.40	0.42	0.31	0.31
Health	Water Heat Le 55 Gal	0.59	0.42	0.35	0.35
Large Office	Space Heat Boiler	0.18	1.00	0.23	0.23
Large Office	Space Heat Furnace	0.84	0.88	0.25	0.25
Large Office	Water Heat Gt 55 Gal	0.40	0.48	0.01	0.01
Large Office	Water Heat Le 55 Gal	0.59	0.48	0.01	0.01
Large Retail	Cooking	1.02	0.58	0.02	0.02
Large Retail	Space Heat Boiler	0.00	1.00	0.22	0.22
Large Retail	Space Heat Furnace	1.02	0.82	0.23	0.22
Large Retail	Water Heat Gt 55 Gal	0.40	0.33	0.00	0.00
Large Retail	Water Heat Le 55 Gal	0.59	0.33	0.01	0.01
Lodging	Cooking	1.02	0.50	0.03	0.03
Lodging	Pool Heat	0.50	1.00	0.29	0.29
Lodging	Space Heat Boiler	1.02	1.00	0.09	0.09
Lodging	Space Heat Furnace	0.00	0.20	0.10	0.10
Lodging	Water Heat Gt 55 Gal	0.40	0.42	0.24	0.24
Lodging	Water Heat Le 55 Gal	0.59	0.42	0.27	0.27
Miscellaneous	Cooking	1.02	0.40	0.01	0.01
Miscellaneous	Pool Heat	0.25	1.00	0.29	0.29
Miscellaneous	Space Heat Boiler	0.10	1.00	0.39	0.39
Miscellaneous	Space Heat Furnace	0.91	0.75	0.40	0.40

Miscellaneous	Water Heat Gt 55 Gal	0.40	0.42	0.01	0.01
Miscellaneous	Water Heat Le 55 Gal	0.59	0.42	0.01	0.01
Restaurant	Cooking	1.02	0.79	0.66	0.66
Restaurant	Space Heat Boiler	0.06	1.00	0.21	0.21
Restaurant	Space Heat Furnace	0.96	0.60	0.21	0.21
Restaurant	Water Heat Gt 55 Gal	0.40	0.55	0.36	0.36
Restaurant	Water Heat Le 55 Gal	0.59	0.55	0.41	0.41
School	Cooking	1.02	0.83	0.01	0.01
School	Pool Heat	0.05	1.00	0.29	0.29
School	Space Heat Boiler	0.25	1.00	0.18	0.18
School	Space Heat Furnace	0.76	0.67	0.19	0.19
School	Water Heat Gt 55 Gal	0.40	0.42	0.04	0.04
School	Water Heat Le 55 Gal	0.59	0.42	0.05	0.05
Small Office	Space Heat Boiler	0.04	1.00	0.24	0.24
Small Office	Space Heat Furnace	0.97	0.75	0.24	0.24
Small Office	Water Heat Gt 55 Gal	0.40	0.45	0.01	0.01
Small Office	Water Heat Le 55 Gal	0.59	0.45	0.01	0.01
Small Retail	Space Heat Boiler	0.07	1.00	0.29	0.29
Small Retail	Space Heat Furnace	0.94	0.70	0.30	0.30
Small Retail	Water Heat Gt 55 Gal	0.40	0.28	0.01	0.01
Small Retail	Water Heat Le 55 Gal	0.59	0.28	0.01	0.01
Warehouse	Space Heat Boiler	0.00	1.00	0.04	0.04
Warehouse	Space Heat Furnace	1.02	0.96	0.05	0.04
Warehouse	Water Heat Gt 55 Gal	0.40	0.42	0.00	0.00
Warehouse	Water Heat Le 55 Gal	0.59	0.42	0.00	0.00

Appendix D. Measure Descriptions

1. Residential Electric Retrofit Measure Descriptions

Heating and Cooling

Construction—ICF. Building a concrete home with insulating concrete forms (ICFs) saves energy. The greater insulation, tighter construction, and temperature-moderating mass of the walls conserve heating and cooling energy much more effectively than conventional wood-frame walls.

Construction—SIP. Structural insulated panels (SIPs) use continuous foam insulation throughout the panel, providing excellent energy efficiency and low air infiltration levels. The baseline is standard wood framing.

Cool Roofs. ENERGY STAR-qualified cool roofs, with reflective coatings, can lower roof surface temperatures by up to 100°F, decreasing amounts of heat transferred into a building. Cool roofs can help reduce amounts of air conditioning needed in buildings, and can reduce peak cooling demand by 10% to 15%.³

Doors. Composite or steel doors with a foam core increase overall insulation, slowing heat loss. This measure includes adding a thermal door with a resistance value of R-5 or R-11 to houses without a thermal or storm door (R-2.9, KY code).

Duct Sealing and Insulation. Duct sealing and insulation cost-effectively save energy, improve air and thermal distribution (comfort and ventilation), and reduce cross-contamination between different zones in buildings (e.g., smoking vs. non-smoking, bio-aerosols, localized indoor air pollutants). This measure assumes a baseline of existing duct conditions sealed and insulated to R-8.

Duct System Efficiency Upgrade—Ducts Inside. In many homes, ducts run through unconditioned areas, such as attics, garages, crawlspaces, and basements, for convenience and practical reasons. Ducts in unconditioned areas lose energy due to large temperature differences between conditioned air in the ducts and the surrounding space. Locating ducts in conditioned spaces helps to reduce wasted heat loss.⁴

Green Roof. The added mass and thermal resistance of green roofs reduce building heating and cooling loads. These systems reduce ambient temperatures around a roof, decreasing a building's urban heat island effect, reducing the ambient temperature of the roof's surface, and slowing the transfer of heat

³ <http://www.aceee.org/consumer/cooling>

⁴ http://www.toolbase.org/pdf/techinv/ductsinconditionedspace_techspec.pdf

into the building, thus lowering cooling costs. They also provide added insulation to the roof structure, reducing heating requirements in winter.⁵

Heat Exchangers, Air-to-Air. An air-to-air heat exchanger mechanically ventilates homes in colder climates. During winter, it transfers heat from exhausted air to fresh, outside air entering the home. Fifty percent to 80% of the heat normally lost in exhausted air returns to the house. Air-to-air heat exchangers can be installed as part of a central heating and cooling system, or in walls or windows. Wall and window-mounted units resemble air conditioners and ventilate one room or an area.⁶

Infiltration Control—Reduction of Existing Conditions. Sealing air leaks in windows, doors, a roof, crawlspaces, and outside walls prevents drafts and reduces overall heating and cooling losses.

Infiltration Control—Reduction of New Thermal Shell. Heat recovery ventilation (HRV) provides fresh air and improved climate control, while saving energy by reducing heating (or cooling) requirements of a building. Combining this feature with better infiltration control (0.2 air changes per hour) minimizes the energy needed to maintain a healthy level of fresh air and reduces heat loss due to air leakage.

Insulation—Attic/Ceiling. This measure represents an increase in R-value. Adding insulation in existing buildings increases thermal performance, and brings the resistance value up to and past code, depending on the vintage. Table D-1.7 summarizes different resistance values compared in the measure.

Table D-1.7. Ceiling R-Value Comparison

Measure Insulation	Baseline Insulation
R-49 (KY Code)	R-15 (Existing Insulation)
R-49 (Above KY Code)	R-38 (KY Code)

Insulation- Basement Wall. Adding insulation to the basement or crawlspace walls increases the thermal performance of the concrete foundation only for existing homes. This measure adds insulation to the existing R-2 level to bring the total insulation level to code (R-10).

Insulation—Floor. Adding insulation to the floor increases the overall resistance value, slowing heat transfer from basements and crawl spaces to upper levels. Table D-1.8 summarizes different resistance values compared in the measure.

Table D-1.8. Floor R-Value Comparison

Measure Insulation	Baseline Insulation
R-30 (Above KY Code)	R-1 (Existing Insulation)
R-30 (Above KY Code)	R-19 (KY Code)

⁵ <http://www.toolbase.org/Technology-Inventory/Roofs/green-roofs>

⁶ <http://cipco.apogee.net/res/reevhex.asp>

Insulation—Slab (New Construction). Substantial heat can be lost through an uninsulated slab, resulting in cold, uncomfortable floors. Even if foundation walls have been insulated vertically under the slab, significant heat escapes from the slab edge closest to the cold outside air. This measure compares a slab insulated with R-15 insulation to a slab insulated to code R-10.

Insulation—Wall. Wall insulation slows the transfer of heat, and reduces heating and cooling loads in houses. **Error! Reference source not found.** compares different insulation levels.

Table D-1.9. Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-13 (KY Code—Maximum Insulation Feasible)	R-2 (Existing Insulation)
R-21 (Above KY Code- New Construction)	R-13 (KY Code)

Quality Installation—Air Conditioner and Heat Pump. Quality installation of an air conditioner and heat pump includes: proper sizing of equipment; and correct refrigerant charge and airflow. By properly sizing HVAC equipment rather than using “rules of thumb,” a system load tool, such as the Air Conditioning Contractors of America (ACCA) guidelines for sizing HVAC equipment (ACCA Manual J Residential Load Calculation), results in optimum equipment operating efficiency and better control.⁷

Thermostat—Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Thermostat—Wi-Fi. Like a programmable thermostat, a Wi-Fi thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours. In addition, the resident can interact through a web and phone app interface, allowing more flexibility to remotely override the programmed settings. The thermostat can learn the residents’ behaviors and adjust based on trends in override data.

Tune-up—Air Conditioner and Air Source Heat Pump. Proper system tune-up/maintenance ensures refrigerant charges and airflows through evaporator coils are properly tested and correctly adjusted — two factors affecting system efficiency. Maintenance includes changing filters and cleaning coils to maintain the overall performance and efficiency of units.

Whole-House Fan. Draws cool outdoor air inside through open windows, and exhausts hot indoor air through the attic to the outside. A whole house fan provides a simple and inexpensive method of cooling a house when outdoor temperatures fall below indoor temperatures.

⁷ <http://www.toolbase.org/Technology-Inventory/HVAC/hvac-sizing-practice>

Window Film. Solar control window films applied to existing windows reduce peak demand during hot months and conserve air conditioning energy. The use of these films also reduces exposure to ultraviolet radiation and glare.⁸

Window—Upgrade. This measure increases building performance by reducing U-values in existing and new construction windows, as shown in Table D-1.10.

Table D-1.10. High-Efficiency Window Measures

Measure Insulation	Baseline Insulation
U-value 0.30 Window (Above KY Code)	Existing Window—Single Pane
U-value 0.25 Window (Above KY Code)	Existing Window—Single Pane
U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)
U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)

Lighting

Photocell Daylighting Control—Interior/Exterior Lighting. Photocells adjust lighting levels according to daylight levels that rooms receive. The baseline is no daylighting controls.

Occupancy Sensors. In a space unoccupied for a designated amount of time, occupancy sensors turn off the lights, turning them on again once the sensor detects a person has entered the space.

Time Clocks (Exterior Lighting). Allows the user to program times to automatically turn outside lights on and off. Programmed exterior lighting saves energy by ensuring lights are not accidentally left on during the daytime.

Water Heat

Clothes Washer. ENERGY STAR and CEE-qualified clothes washers use less energy and water than regular washers.⁹ Table D-1.11 lists baseline and measure modified energy factor (MEF) and water factor (WF) levels considered. Note: each measure has multiple baselines, which change over time due to changes in federal standards.

Table D-1.11. Clothes Washer Modified Energy and Water Factor Comparisons

Measure Level	Efficiency (MEF & WF)
Federal Standard 2011 [Baseline]	MEF 1.48 and WF 9.5
Federal Standard 2016 [Baseline]	MEF 1.72 and WF 8.0
Federal Standard 2018 [Baseline]	MEF 2.0 and WF 6.0
ENERGY STAR	MEF 2.0 and WF 6.0
CEE Tier 2	MEF 2.2 and WF 4.5
CEE Tier 3	MEF 2.4 and WF 4.0

⁸ http://www.iwfa.com/iwfa/Consumer_Info/windowfilmbenefits.html

⁹ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

Dishwasher. ENERGY STAR-qualified dishwashers use advanced technology to clean dishes, using less water and energy. As shown in Table D-1.12, two efficiency levels were compared for this measure.

Table D-1.12. Dishwasher Efficiency Levels

Measure Level	Measure kWh/yr & Gal/Cycle	Baseline kWh/yr & Gal/Cycle
ENERGY STAR	295 kWh/yr 4.25 Gal/Cycle	307 kWh/yr 5 Gal/Cycle
Enhanced Efficiency	250 kWh/yr 4.25 gal/cycle	307 kWh/yr 5 Gal/Cycle

Drain Water Heat Recovery. Also called gravity film heat exchanges, these devices, which recover heat energy from domestic drain water, are used to pre-heat cold water entering hot water tanks. This minimizes temperature differences between heating set points and entering water temperatures.

Faucet Aerators. Faucet aerators, by mixing water and air, reduce amounts of water flowing through faucets. The faucet aerator creates a fine water spray, using a screen inserted in the faucet head. Table D-1.13 presents the flow rate requirements for this measure.

Table D-1.13. Faucet Aerator Flow Rates

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.2 GPM	3.0 GPM (Existing)
1.5 GPM	2.2 GPM
0.5 GPM	2.2 GPM

* Gallons per minute.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead, which creates a fine water spray through an inserted screen. This measure represents the various showerhead flow rate reduction levels shown in Table D-1.14.

Table D-1.14. Low-Flow Showerhead Water Flow Levels

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.5 GPM	3.0 GPM (Existing)
2.0 GPM	2.5 GPM
1.75 GPM	2.5 GPM
1.5 GPM	2.5 GPM

* Gallons per minute

Hot Water Pipe Insulation. The addition of R-4 insulation around pipes decreases heat loss. The baseline is a hot water pipe without insulation

Appliances

Freezer—Removal of Standalone. This refers to environmentally friendly disposal of unneeded and/or inefficient standalone freezers. Removal of standalone freezers eliminates the freezer's consumption. Proper disposal is required, as the units use hazardous materials, such as Freon and CFCs.

Refrigerator—Removal of Secondary. This refers to environmentally friendly disposal of unneeded and/or inefficient secondary refrigerators. The removal eliminates the refrigerator’s consumption. Proper disposal is required, as the units use hazardous materials, such as Freon and CFCs.

Plug Load

Smart Strip. Energy-saving products, such as power strips with an occupancy sensor, are placed in workstations where power strips are commonly used. Based on occupancy within the work area, the sensor turns on and off power to all devices, such as computers, desk lights, and audio equipment plugged into the power strip.

Other

Pool Pump Timers. A pool pump with a timer set to run during off-peak times (starting after 8:00 p.m. and cycling off before 10:00 a.m.) reduces energy costs. Cycling the pumps will further reduce monthly costs. The baseline is a continuously running pump.

2. Residential Electric Equipment Measure Descriptions

Heating and Cooling

Central Air Conditioners. This measure consists of several different air conditioner technology/efficiency levels, as summarized in Table D-1.15. The baseline size is the same as the measure size.

Table D-1.15. Central Air Conditioner Efficiency Comparison

Measure SEER/EER	Baseline SEER/EER
Federal Standard 2015—SEER/EER 14/12.2*	Federal Standard 2006 SEER/EER 13/11
ENERGY STAR—SEER/EER 14.5/12	
CEE Tier 3—SEER/EER 16/13	
Enhanced—SEER/EER 18/14	
Evaporative Cooler	

* Becomes baseline after 2015.

Ductless Air Conditioner (DAC). DACs use less energy than room air conditioners, while producing less noise and requiring no costly ductwork. DACs have a SEER/EER of 18/12.5, replacing a room air conditioner unit with a 9.7/9.8 SEER/EER.

Ductless Heat Pump (DHP). DHPs move heat to or from the air to cool and heat a home without the need for costly ductwork. This method of heating has a HSPF value of 10.0, consuming less energy than baseboard heating that has a 3.41 HSPF.

Electronically Commutated Motor (ECM)—Air Conditioner/Electric/Gas Furnace ECM Fan and Air Source Heat Pump. ECMs are smaller, variable-speed motors that operate from a single-phase power source, which consumes less power than standard motors in ventilation and circulation systems. The baseline measure is a standard-efficiency motor.

Heat Pump—Air or Ground Source (ASHP or GSHP). Electric heat pumps move heat to or from the air or ground to cool and heat homes. Table D-1.16 shows different efficiency levels compared in this measure. The baseline size is the same as the measure size.

Table D-1.16. Heat Pump SEER/HSPF Comparisons

Measure	Cooling SEER/EER	Heating HSPF	Baseline	Cooling SEER/EER	Heating HSPF
Federal Standard 2015*	14/12	8.2	Federal Standard 2006	13/11	7.7
ENERGY STAR	14.5/12	8.2			
CEE Tier 2	15/12.5	8.5			
Premium	16/13	9.0			
Enhanced	18/14	9.5			
ENERGY STAR Ground Source Heat Pump	NA/17.1	3.6 COP			

*Becomes the baseline after 2015.

Room Air Conditioner (Room AC)—(8,000-13,999 BTU/HR). ENERGY STAR-qualified room air conditioners use less energy than conventional models, through improved energy performance as well as timers for better temperature control. Table D-1.17 shows different efficiency tiers considered in this measure.

Table D-1.17. Room AC CEER/EER Comparisons

Measure CEER/EER	Baseline CEER/EER
Federal Standard 2015—CEER/EER 10.9/11*	Federal Standard 2001 CEER/EER 9.7/9.8
ENERGY STAR—CEER/EER 10.7/10.8	Federal Standard 2001 CEER/EER 9.7/9.8

*Becomes the baseline after 2015.

Lighting

General Service Lamp

Compact Fluorescent Light Bulbs (CFLs). Standard CFLs use less energy than the maximum mandated by the Energy Independence and Security Act of 2007 (EISA). This measure considers exterior and interior, standard, screw base lighting, and measure and baseline consumption is a weighted average of bulb wattages used in each condition. The baseline for this measure reflects changes over 2012–2014 to accommodate EISA.

Light Emitting Diodes (LEDs). LEDs are solid-state devices, converting electricity to light using very high efficiencies, requiring significantly less energy, and providing long lifetimes. This measure considers exterior and interior, standard, screw base lighting, and measure and baseline consumption is a weighted average of bulb wattages used in each condition. The baseline for this measure reflects changes over 2012–2014 to accommodate EISA.

Specialty Lamp

CFLs. Specialty CFLs use less energy than incandescent light bulbs. This measure considers interior specialty lighting, including the bulb types listed below, and the measure and baseline consumption is a weighted average of bulbs used in each condition. The baseline for this measure is an incandescent light bulb.

LEDs. LEDs are solid-state devices, converting electricity to light using very high efficiency, requiring significantly less energy, and providing long lifetimes. This measure considers interior specialty lighting, including the bulb types listed below, and measure and baseline consumption is a weighted average of bulbs used in each condition. The baseline for this measure is an incandescent light bulb.

- Specialty lamps include:
 - 3-Way
 - Dimmable
 - CC Candelabra—decorative
 - CC Candelabra—primary
 - Torpedo
 - Reflector
 - Globe
 - A-Lamp
 - Daylight
 - High Wattage
 - T2 Twist
 -

Water Heat

Solar Hot Water (SHW). Solar water heating systems include storage tanks and solar collectors, and operate using two types of solar water heating systems: active, which have circulating pumps and controls; and passive, which do not have pumps and controls. Either system actively increases the water temperature entering the storage tank, reducing the amount of energy required by the hot water heater to achieve the set point temperature.¹⁰ This measure applies to solar water heaters less than or equal to 55 gallons and is compared to a federal standard, 2004, storage water heater with a 0.92 EF.

Water Heater—Heat Pump. A heat pump moves heat from a warm reservoir (such as air), transferring this heat into hot water systems.¹¹ Table D-1.18 lists baseline and measure efficiencies.

¹⁰ http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850

¹¹ Description source: U.S. Department of Energy;
http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12840

Table D-1.18. Heat Pump Water Heater Comparisons

Measure Efficiency	Baseline Efficiency
Federal Standard 2015 > 55 GAL—EF 1.97*	Federal Standard 2004 Storage Water Heater > 55 GAL—EF 0.87
ENERGY STAR > 55 GAL—EF 2.2	
ENERGY STAR ≤ 55 GAL—EF 2.0	Federal Standard 2004 Storage Water Heater ≤ 55 GAL—EF 0.92

*Becomes baseline after 2015.

Water Heater—Storage. High-efficiency water heaters operate more efficiently than standard electric water heaters due to reduced standby losses. This measure assumes an energy factor (EF) for high-efficiency water heaters less than or equal to 55 gallons of 0.95 (Federal Standard, April 2015), an increase from a standard EF of 0.92 (Federal Standard, 2004).

Appliances

Cooking Oven. High-efficiency convection ovens operate at lower temperatures and achieve quicker cook times than standard ovens, due to fans circulating heat evenly throughout the oven. The baseline is a 2012, federal standard oven.

High Efficiency Dryer. High-efficiency dryers have features, such as moisture sensors, that minimize energy usage while retaining performance. The efficiency levels for this measure are shown in Table D-1.19.

Table D-1.19. Dryer EF Comparison

Measure	Baseline
Federal Standard 2015 Dryer—CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor—CEF/EF 3.14/3.19
Enhanced Efficiency Dryer—CEF/EF 3.79/3.9	

Dehumidifier—ENERGY STAR. ENERGY STAR-qualified models use more efficient refrigeration coils, compressors, and fans than conventional models, thus using less energy to remove moisture. These qualified models remove the same amount of moisture as a similarly-sized standard unit, but use 10% to 20% less energy. The baseline for this measure is a 2013 federal standard dehumidifier.¹²

Freezer. ENERGY STAR-qualified freezers use at least 10% less energy than standard models due to improvements in insulation and compressors. This measure considers the change in 2015 federal standard efficiency, as shown in Table D-1.20.

Table D-1.20. Freezer Measure Levels

Measure Level	Baseline Level
Federal Standard 2015*	Federal Standard 2001
ENERGY STAR	

*Becomes baseline after 2015.

¹² http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DE

Microwave—High-Efficiency. High-efficiency microwaves, with more efficient power supplies, fans, magnetrons, and reflective surfaces, provide energy savings in comparison with conventional microwaves.

Refrigerator. ENERGY STAR and CEE-qualified refrigerators use at least 20% less energy than standard models due to improvements in insulation and compressors. This measure considers the change in 2015 federal standard efficiency and two CEE tiers above ENERGY STAR, as shown in Table D-1.21.

Table D-1.21. Refrigerator Measure Levels

Measure Level	Baseline Level
Federal Standard 2015*	Federal Standard 2001
ENERGY STAR	
CEE Tier 2	
CEE Tier 3	

*Becomes baseline after 2015.

Plug Load

Computer—ENERGY STAR. ENERGY STAR computers consume less than 2 watts in “sleep” and “off” modes, and are more efficient than conventional units in “idle” modes, resulting in 30% to 65% energy savings.

DVD Player—ENERGY STAR. ENERGY STAR-qualified DVD products meeting the new requirements use up to 60% less energy than standard models.¹³ ENERGY STAR DVD players use only 1 watt, as little as one-fourth of the energy used by standard models, in “off” or “sleep” modes. The baseline for this measure is a standard DVD player.

Home Audio System—ENERGY STAR. According to ENERGY STAR specifications, qualified audio systems must have: default power down timing; 1 watt sleep/off mode consumption; and 55% efficiency for amplifiers greater than 20 watts input power.¹⁴

Monitors—ENERGY STAR. ENERGY STAR monitors feature: (1) an “on” mode, where the maximum allowed power varies, based on the computer monitor’s resolution; (2) a “sleep” mode, where computer monitor models must consume 2 watts or less; and (3) an “off” mode, where computer monitor models must consume 1 watt or less. The baseline equipment does not include these features.¹⁵

Office Multifunction Device—ENERGY STAR. ENERGY STAR models meeting the most recent ENERGY STAR requirements are 40% more energy efficient, and feature efficient designs, helping the equipment run cooler and last longer.

¹³ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DP

¹⁴ http://www.energystar.gov/index.cfm?c=audio_dvd.pr_crit_audio_dvd

¹⁵ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.ShowProductGroup&pgw_code=MO

Office Copier—ENERGY STAR. ENERGY STAR copiers deliver the same performance as conventional equipment and are, on average, 27% more efficient, and power down when not in use. The baseline measure is a non-ENERGY STAR copier.¹⁶

Office Printers—ENERGY STAR fax machines enter sleep mode after inactivity. This reduces their total power consumption by 50%.¹⁷

Set Top Box—ENERGY STAR. Set-top boxes earning the ENERGY STAR label operate at least 40% more efficiently than conventional models.¹⁸ The baseline measure is a standard receiver.

TV—ENERGY STAR. ENERGY STAR-qualified TVs use about 40% less energy than standard units.¹⁹ ENERGY STAR models must consume no more than 1 watt while in sleep mode. The baseline is a standard television, generally consuming more than 3 watts when off.

Other

Pool Pumps—Two-Speed Motor. This enables pool pump motors to run at high and low speeds, rather than constantly running at full power. The baseline for this measure is a standard, one-speed motor.

Pool Pumps—VSD. This enables pool pump motors to run at variable speeds, as opposed to constantly running at full power. The baseline for this measure is a standard, one-speed motor.

3. Residential Natural Gas Retrofit Measure Descriptions

Heating

Boiler Controls. Boiler controls reduce energy used by residential boilers by controlling supply water temperatures, optimizing firing cycles, and applying zone controls.

Boiler Pipe Insulation. Applying 10 linear feet of R-6 thermal insulation to pipes transporting hot water from the boiler reduces heat loss and increases boiler efficiency.

Construction—ICF. Building a concrete home with ICFs saves energy. The greater insulation, tighter construction, and temperature-moderating mass of the walls conserve heating and cooling energy much more effectively than conventional wood-frame walls.

Construction—SIP. SIPs use continuous foam insulation throughout the panel, providing excellent energy efficiency and low air infiltration levels. The baseline is standard wood framing.

¹⁶ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CP

¹⁷ http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf

¹⁸ http://www.energystar.gov/index.cfm?c=settop_boxes.settop_boxes

¹⁹ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=TV

Doors. Composite or steel doors with a foam core increase overall insulation, slowing heat loss. This measure includes adding a thermal door with a resistance value of R-5 or R-11 to houses without a thermal or storm door (R-2.9, KY code).

Duct Sealing and Insulation. Duct sealing and insulation cost-effectively save energy, improve air and thermal distribution (comfort and ventilation), and reduce cross-contamination between different zones in buildings (e.g., smoking vs. non-smoking, bio-aerosols, localized indoor air pollutants). This measure assumes a baseline of existing duct conditions sealed and insulated to R-8.

Green Roof. The added mass and thermal resistance of green roofs reduce building heating and cooling loads. These systems reduce ambient temperatures around a roof, decreasing a building's urban heat island effect, reducing the ambient temperature of the roof's surface, and slowing the transfer of heat into the building, thus lowering cooling costs. They also provide added insulation to the roof structure, reducing heating requirements in winter.²⁰

Heat Exchangers Air-to-Air. An air-to-air heat exchanger mechanically ventilates homes in colder climates. During winter, it transfers heat from exhausted air to fresh, outside air entering the home. Fifty percent to 80% of the heat normally lost in exhausted air returns to the house. Air-to-air heat exchangers can be installed as part of a central heating and cooling system, or in walls or windows. Wall and window-mounted units resemble air conditioners, and ventilate one room or an area.²¹

Infiltration Control—Reduction of Existing Conditions. Sealing air leaks in windows, doors, a roof, crawlspaces, and outside walls prevents drafts and reduces overall heating and cooling losses.

Infiltration Control—Reduction of New Thermal Shell. HRV provides fresh air and improved climate control, while also saving energy by reducing the heating (or cooling) requirements of a building. Combining this feature with better infiltration control (0.2 air changes per hour) minimizes the energy needed to maintain a healthy level of fresh air and reduces heat loss due to air leakage.

Insulation—Attic/Ceiling. This measure represents an increase in R-value. Adding insulation in existing buildings increases thermal performance, and brings the resistance value up to and past code, depending on the vintage. Table D-1.22 summarizes different resistance values compared in the measure.

Table D-1.22. Ceiling R-Value Comparison

Measure Insulation	Baseline Insulation
R-49 (KY Code)	R-15 (Existing Insulation)
R-49 (Above KY Code)	R-38 (KY Code)

²⁰ <http://www.toolbase.org/Technology-Inventory/Roofs/green-roofs>

²¹ <http://cipco.apogee.net/res/reevhex.asp>

Insulation—Basement Wall. Adding insulation to basement or crawlspace walls increases the thermal performance of the concrete foundation (only for existing homes). This measure adds insulation to the existing R-2 level to bring the total insulation level to code (R-10).

Insulation—Floor. Adding insulation to the floor increases the overall resistance value, slowing heat transfer from basements and crawl spaces to upper levels. Table D-1.23 summarizes different resistance values compared in the measure.

Table D-1.23. Floor R-Value Comparison

Measure Insulation	Baseline Insulation
R-30 (Above KY Code)	R-1 (Existing Insulation)
R-30 (Above KY Code)	R-19 (KY Code)

Insulation—Slab (New Construction). Substantial heat can be lost through an uninsulated slab, resulting in cold, uncomfortable floors. Even if foundation walls have been insulated vertically under the slab, significant heat escapes from the slab edge closest to the cold outside air. This measure compares a slab insulated with R-15 insulation to a slab insulated to code R-10.

Insulation—Wall. Wall insulation slows the transfer of heat, and reduces heating and cooling loads in houses. Table D-1.24 compares different insulation levels.

Table D-1.24. Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-13 (KY Code—Maximum Insulation Feasible)	R-2 (Existing Insulation)
R-21 (Above KY Code- New Construction)	R-13 (KY Code)

Integrated Space Heating/Water Heating. These systems provide space conditioning and hot water heating in one appliance/energy source. Domestic hot water is heated directly, and space is heated by a hot water heat exchanger coil, piped to the forced air heating system. This combination space/water heating system provides high-efficiency heating for the cost of one high-efficiency appliance.

Thermostat—Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Quality Installation—Furnace and Boiler. Quality installation of furnaces and boilers includes: proper sizing of equipment and ducts; proper airflow; and proper control settings resulting in optimum equipment operating efficiency and better control.²²

Thermostat—Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

²² <http://www.toolbase.org/Technology-Inventory/HVAC/hvac-sizing-practice>

Thermostat—Wi-Fi. Like a programmable thermostat, a Wi-Fi thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours. In addition, the resident can interact through a web and phone app interface, allowing more flexibility to remotely override the programmed settings. The thermostat can learn the residents' behaviors, and adjust based on trends in override data.

Tune-up—Furnace and Boiler. This measure involves a technician completing the following: measure combustion efficiency; adjusting air fuel mixtures; cleaning heat exchanger tubes; adjusting draft controls; cleaning burners; cleaning burner nozzles; and checking for venting, increasing the efficiency of the heating system.

Whole-House Fan. These fans draw cool outdoor air inside through open windows, and exhausts hot indoor air through the attic to the outside. A whole-house fan provides a simple and inexpensive method of cooling a house when outdoor temperatures fall below indoor temperatures.

Window—Upgrade. This measure increases building performance by reducing U-values in existing and new construction windows, as shown in Table D-1.25.

Table D-1.25. High-Efficiency Window Measures

Measure Insulation	Baseline Insulation
U-value 0.30 Window (Above KY Code)	Existing Window—Single Pane
U-value 0.25 Window (Above KY Code)	Existing Window—Single Pane
U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)
U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)

Water Heat

Clothes Washer. ENERGY STAR and CEE-qualified clothes washers use less energy and water than regular washers.²³ Table D-1.26 lists baseline and measure MEF and WF levels considered. Note: each measure has multiple baselines, which change over time due to changes in the federal standard.

Table D-1.26. Clothes Washer Modified Energy and Water Factor Comparisons

Measure Level	Efficiency (MEF & WF)
Federal Standard 2011 [Baseline]	MEF 1.48 and WF 9.5
Federal Standard 2016 [Baseline]	MEF 1.72 and WF 8.0
Federal Standard 2018 [Baseline]	MEF 2.0 and WF 6.0
ENERGY STAR	MEF 2.0 and WF 6.0
CEE Tier 2	MEF 2.2 and WF 4.5
CEE Tier 3	MEF 2.4 and WF 4.0

Dishwasher. ENERGY STAR-qualified dishwashers use advanced technology to clean dishes, using less water and energy. As shown in Table D-1.27, two efficiency levels were compared for this measure.

²³ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

Table D-1.27. Dishwasher Efficiency Levels

Measure Level	Measure kWh/yr & Gal/Cycle	Baseline kWh/yr & Gal/Cycle
ENERGY STAR	295 kWh/yr 4.25 Gal/Cycle	307 kWh/yr 5 Gal/Cycle
Enhanced Efficiency	250 kWh/yr 4.25 gal/cycle	307 kWh/yr 5 Gal/Cycle

Drain Water Heat Recovery. Also called gravity film heat exchanges, this device recovers heat energy from domestic drain water, which is then used to pre-heat cold water entering the hot water tank. This minimizes the temperature difference between the heating set point and the temperature of water entering the system.

Pipe Insulation-Water Heater. The addition of R-4 insulation around pipes decreases heat loss. The baseline is a hot water pipe without insulation.

Faucet Aerators. Faucet aerators, by mixing water and air, reduce amounts of water flowing through faucets. The faucet aerator creates a fine water spray, using a screen inserted in the faucet head. Table D-1.28 presents flow rate requirements for this measure.

Table D-1.28. Faucet Aerator Flow Rates

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.2 GPM	3.0 GPM (Existing)
1.5 GPM	2.2 GPM
0.5 GPM	2.2 GPM

*Gallons per minute.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead, which creates a fine water spray through an inserted screen. This measure represents the various showerhead flow rate reduction levels, as shown in Table D-1.29.

Table D-1.29. Low-Flow Showerhead Water Flow Levels

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.5 GPM	3.0 GPM (Existing)
2.0 GPM	2.5 GPM

* Gallons per minute

Other

Pool Covers. This measure reduces evaporation, which is the largest source of pool/spa energy loss. It takes one British thermal unit (Btu) to raise 1 pound of water by 1 degree. Each pound of 80° F water that evaporates takes 1,048 Btus of heat out of the pool.²⁴ The baseline measure is an uncovered pool or spa.

²⁴ http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=13140

4. Residential Natural Gas Equipment Measure Descriptions

Heating

Gas Boiler. Boilers are classified as condensing or non-condensing. Condensing boilers condense flue gas and water vapor, extracting useful heat and improving the boiler efficiency. This measure compares several boilers with different thermal efficiencies and is applicable to both new and existing construction. The overall efficiency of the boiler is defined as the gross energy output, divided by the energy input, and is affected by combustion efficiency, standby losses, cycling losses, and heat transfer. Table D-1.30 displays the measure and baseline thermal efficiencies.

Table D-1.30. Gas Boiler Efficiency Comparison

Measure	Baseline
High-efficiency Boiler—90% AFUE	Federal Standard 2012 Boiler—82% AFUE
Premium Efficiency Boiler—94% AFUE	
Advanced Efficiency Boiler—98% AFUE	

Gas Furnace. Improvements in furnace technology, such as new ignition and heat exchange designs, have led to increased furnace efficiency. AFUE levels considered in this measure are shown in Table D-1.31.

Table D-1.31. Gas Furnace Efficiency Comparison

Measure	Baseline
ENERGY STAR Furnace—90% AFUE	Federal Standard 1992 Furnace—78% AFUE
High-efficiency Furnace—94% AFUE	
Premium Efficiency Furnace—98% AFUE	

Water Heat

Water Heater, Condensing. Gas condensing water heaters have an improved design that reduces consumption by 30% while maintaining superior performance. EFs considered in this measure are shown in Table D-1.32.

Table D-1.32. Water Heater EF Comparison

Measure	Baseline
Federal Standard 2015 Condensing Water Heater > 55 GAL—EF 0.74	Federal Standard 2004 Storage Water Heater > 55 GAL—EF 0.53
Condensing Water Heater > 55 GAL—EF 0.85	
Condensing Water Heater ≤ 55 GAL—EF 0.90	Federal Standard 2004 Storage Water Heater ≤ 55 GAL—EF 0.59

Water Heater, Storage. A high-efficiency water heater reduces standby loss and is more efficient than a standard gas water heater. The EFs considered in this measure are shown in Table D-1.33.

Table D-1.33. Water Heater EF Comparison

Measure	Baseline
ENERGY STAR Storage Water Heater > 55 GAL—EF 0.67	Federal Standard 2004 Storage Water Heater > 55 GAL—EF 0.53
Federal Standard 2015 Storage Water Heater ≤ 55 GAL—EF 0.62	Federal Standard 2004 Storage Water Heater ≤ 55 GAL—EF 0.59
ENERGY STAR Storage Water Heater ≤ 55 GAL—EF 0.67	

Water Heater, Tankless. Tankless water heaters provide hot water at a preset temperature when needed and without storage, thereby reducing or eliminating standby losses. An EF of 0.82 was used for the tankless system and compared to a standard water heater with an EF of 0.59.

Appliances

Cooking Oven, High Efficiency. A high-efficiency convection oven operates at lower temperatures and achieves quicker cooking times than a standard oven, due to fans circulating heat evenly throughout the oven by moving hot air past the food. The baseline is a standard oven.

High Efficiency Dryer. High-efficiency dryers have features, such as moisture sensors, that minimize energy usage while retaining performance. The efficiency levels for this measure are shown in Table D-1.34.

Table D-1.34. Dryer EF Comparison

Measure	Baseline
Federal Standard 2015 Dryer—CEF/EF 3.30/3.38	Standard Dryer with Controls and Moisture Sensor—CEF/EF 2.70/2.74
Enhanced Efficiency Dryer—CEF/EF 3.54/3.63	

Other (Pool)

Energy Efficiency Pool Heater. Gas pool heaters use natural gas or propane. As the pump circulates the pool's water, the water passes through a filter and then to the heater. Gas burns in the heater's combustion chamber, generating the heat that warms the water returning to the pool. This measure assumes an efficiency level of 88%, compared to a standard 83% efficient pool heater.

5. Commercial Electric Retrofit Measure Descriptions

Heating and Cooling

Automated Exhaust VFD Control, Parking Garage CO₂ Sensor. This measure allows the ventilation system to run only when CO levels rise above a specified level. The ventilation system would run constantly without this measure.

Automated Ventilation (VFD) Control (Occupancy Sensors/CO₂ sensors). This measure is also known as demand-control ventilation (DCV), where the ventilation system automatically adjusts air flow when CO₂ rises above a specified level. CO₂ controls maintain a minimum ventilation rate at all times to control non-occupant contaminants, such as off-gassing from furniture, equipment, and building components. The baseline of this measure is a ventilation system that runs constantly.

Chilled Water Piping Loop with (VSD) Control. A VSD controller, with two-way valves at the cooling coils, controls the chilled water pump speed to vary, based on the cooling load, thus reducing pumping energy requirements. The baseline is a constant speed pump with three-way valves.

Chilled Water Reset. A water reset controller varies the temperature of chilled water in a loop, allowing increased water temperatures as cooling requirements decrease. The baseline measure is no water reset.

Chilled Water-Side Economizer. This measure consists of a heat exchanger attached to a condenser water piping loop, which operates when outdoor conditions produce colder condenser water than the mixed air temperature. A water-side economizer is used when an outdoor-air economizer is not practical. The baseline measure is no economizer.

Chiller, Pipe Insulation. Adding insulation to water pipes yields an approximate R-value of R-4 per inch, which decreases temperature losses, thereby reducing demand on chilled water systems.

Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The baseline measure is no commissioning.

Convert Constant Volume Air System to VAV. The VAV allows the airflow volume of a HVAC system to vary heating or cooling loads rather than over-conditioning and short-cycling. The baseline in this case is a constant volume system.

Cool Roofs. ENERGY STAR[®]-qualified cool roofs can lower roof surface temperatures up to 100°F, thereby decreasing amounts of heat transferred into a building. Cool roofs can help reduce amounts of air conditioning needed in buildings, and can reduce peak cooling demand by 10%–15%. This measure could be considered a passive measure.

Cooling Tower—Decrease Approach Temperature. An oversized cooling tower allows a reduced approach temperature, which saves energy. The approach temperature is the difference between the

tower water leaving and the wet-bulb temperature. This measure assumes a 6-degree delta, compared to the baseline of a 10-degree temperature delta.

Cooling Tower-Two-Speed Fan Motor. A two-speed fan cycles between off, low, and high speeds to maintain the tower set point. The low-speed setting option uses less energy than a single, high-speed fan. The baseline measure is a single-speed fan motor.

Cooling Tower—VSD Fan Control. A VSD is one-step more sophisticated than a two-speed fan motor. A VSD drive modulates the air flow; so heat rejection exactly matches the load at the desired set point. The baseline measure is a two-speed fan motor.

DX Package-Air Side Economizer. An air-side economizer uses already cooled air (return air), mixed with a proportion of outside air to cool indoor spaces. Using the return air results in energy savings, as less air must be cooled.

Demand Controlled Circulating Systems. A demand-controlled circulating system only circulates hot water when required. The baseline measure is a continuously circulating hot water system, resulting in energy loss through pipes.

Direct Digital Control (DDC) System-Installation. DDC systems allow both HVAC and lighting to be controlled and monitored. For lighting, the DDC system allows direct control of lights from a remote location. Entire HVAC systems, including pumps, motors, fans, and set points, can be digitally programmed for tighter control of the system.

Duct Repair and Sealing. The repair and sealing of leaky ducts creates significant energy savings by ensuring conditioned air only goes to occupied spaces, thereby reducing excessive runtimes/loads on HVAC systems.

Exhaust Air to Ventilation Air Heat Recovery. Captures air exhausted out of a building during the heating season, when it would be warmer than the air outside. Transferring this heat to incoming air lowers overall heating loads.

Exhaust Hood Makeup Air. Provides exhaust air at the hood instead of allowing the hood to exhaust conditioned air in the room. The baseline measure is conditioned air expelled through exhaust hoods.

Green Roof. A green roof is a living roof, supporting soil and plant growth. A series of carefully engineered layers, applied to the roof deck, are watertight, lightweight, and long lasting. Green roofs can be incorporated into new buildings as long as load requirements can be met. They are suited for roofs with slopes ranging up to 20°, and are most successful when sufficient attention has been paid to selecting plants that thrive in local climates and conditions. One of the most significant advantages green roofs offer is that they can last up to three times longer than a standard roof. A green roof can also buffer temperature extremes, improving a building's energy performance by dropping the temperatures on the roof.

Hotel Key Card Room Energy Control System. This key card system controls room HVAC and lighting during non-occupied periods. Occupancy is determined by presence of a key card and/or additional sensors. The central system sets heating and cooling to a minimum, and turns off lighting when the key card is removed. Once a guest returns and inserts the key card, they can fully control of the room systems.

Infiltration Reduction. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. The baseline measure is 1.00 Air Changes per Hour (ACH), while the measure value is 0.65 ACH.

Insulation—Ceiling. These measures represent an increase in R-value from existing building conditions to current state code, and from current state code to better than code R-value improvements. Table D-1.7 presents the baseline and measure values.

Table D-2.35. Ceiling Insulation Measures

Measure	Baseline
R-20ci (KY State Code)	Average Existing Conditions
R-30	R-20ci (KY State Code)

Insulation—Duct. Packaged DX and heat-pump equipment generally are coupled with a ducting system inside a building. Insulating ducts reduces energy loss in unoccupied plenum space. Table D-2.36 presents the baseline and measure values.

Table D-2.36. Duct Insulation Measures

Measure	Baseline
R-5 (KY State Code)	Average Existing Conditions
R-8	R-5 (KY State Code)

Insulation—Floor (Non-slab). These measures represent an R-value increase from existing building conditions to current state code, and from current state code to better than code R-value improvements for the floor space (non-slab). Table D-2.37 presents the baseline and measure values.

Table D-2.37. Floor Insulation Measures

Measure	Baseline
R-30 (KY State Code)	Average Existing Conditions
R-38	R-30 (KY State Code)

Insulation—Wall. These measures represent an increase in the R-value to current state code values or better. Table D-2.38 presents the baseline and measure values.

Table D-2.38. Wall Insulation Measures

Measure	Baseline
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R-13 + 7.5 (KY State Code)	Average Existing Conditions
R-13 + 10	R-13 + 7.5 (KY State Code)

Re-Commissioning. The commissioning process can be applied to existing buildings to restore them to optimal performance. Retrocommissioning is a systematic, documented process, identifying low-cost operational and maintenance improvements in existing buildings, and bringing the buildings up to the design intentions of its current operation.^{25,26} The baseline measure is no commissioning.

Tune-up—Chiller Maintenance. Proper system tune-up/maintenance ensures correct water system flow rates, temperatures of heating and cooling delivery systems (air side and water side), positions and functioning of flow control devices for air and water delivery systems, control settings and operation, and pump speeds and pressures. The baseline is an unmaintained chiller.

Tune-up—Air Conditioner, Air Source, and Ground Source Heat Pumps. Proper system tune-up/maintenance ensures refrigerant charges and airflows through evaporator coils have been properly tested and correctly adjusted—two factors affecting system efficiency. Maintenance includes changing filters and cleaning coils to maintain overall performance and efficiency of the unit.

Window Film. Solar control window films, applied to existing windows, reduce peak demand during hot months, and conserve energy when air conditioning might be required. In addition to energy-management benefits, use of these films reduces exposure to ultraviolet radiation and glare.²⁷

Windows—High Efficiency. This measure represents an increase in building performance by reducing the U-value in existing construction and new construction windows, as shown in Table D-2.39.

Table D-2.39. High-Efficiency Window Measures

Measure U-Value	Baseline U-Value
U-0.40 (KY State Code)	Average Existing Condition
U-0.32	U-0.40 (KY State Code)

Lighting

Bi-Level Control, Stairwell Lighting. This measure allows an occupancy sensor to reduce the light load in an unoccupied stairwell by 50% for a set period of time. The baseline is continuous operation at full power.

Daylighting Controls, Outdoors (Photocell). Exterior lighting controls via photocell turn on and off exterior light fixtures when sunlight levels reach desired set points. The measure achieves savings over

²⁵ <http://www.green.ca.gov/CommissioningGuidelines/default.htm>

²⁶ <http://cbs.lbl.gov/BPA/cct.html>

²⁷ http://www.iwfa.com/iwfa/Consumer_Info/windowfilmbenefits.html

time-clock or manual controls through changes in seasonal and site conditions by improving nighttime durations.

Dimming—Continuous, Fluorescent Fixtures. A dimming switch allows light levels to vary from 0%–100% brightness. A continuously dimming switch permits variations throughout the range, increasing electricity savings. The baseline measure is operating fluorescent fixtures at full power.

Dimming—Stepped, Fluorescent Fixtures. The fixtures allow the user to vary light levels by a number of specified tiers to adjust for amounts of outside daylight. Operating fluorescent fixtures at full power represents the baseline measure.

Display Case LEDs. LEDs are highly efficient bulbs that can be used for refrigeration case lights, resulting in energy savings over a standard fluorescent case light. This measure applies specifically to closed cases.

Display Case LEDs (Open Cases). LEDs can be used for refrigeration case lights, resulting in energy savings over a standard fluorescent case light. This measure applies specifically to open cases.

Exit Sign—LED. LED exit signs use only 6 watts of power and last over 50,000 hours, while CFL exit signs use 26 watts of power and have a shorter life.

Exit Sign—Photoluminescent or Tritium. Photoluminescent or tritium signs use little to no energy (a maximum of 2 watts), while providing bright lighting suitable for exit signage. This measure's low-energy consumption can provide savings, compared to the 6 watts consumed by LED signs.

Exterior Building Lighting. An exterior lighting package results in a 30% decrease in lighting power density. The baseline lighting technology is representative of all available technologies making up total watts per square foot.

Occupancy Sensor Control. These units turn off lighting in areas where activity is not detected. Occupancy sensors can control single or multiple lighting zones. Controlled lighting wattage varies, depending on applications. The baseline assumes no lighting controls.

Parking—Covered Lighting. Replacing inefficient metal halide lamps with LEDs and high-pressure sodium lamps with LED Low Bay lighting, reduces energy use of covered parking garages.

Parking—Surface Lighting. By replacing inefficient metal halide lamps with LED lighting, the energy use of surface parking lots can be reduced.

Time Clock. The units include an integrated time-clock, which automatically switches lighting and other loads on and off on a time schedule, or in response to an occupancy sensor or building automation system.

Refrigeration

Anti-Sweat (Humidistat) Controls. This measure enables the user to turn refrigeration display case anti-sweat heaters off when the ambient relative humidity is low enough to prevent sweating. Without controls, heaters generally run continuously.

Case Electronically Commutated Motor. A case fan is one component of a refrigeration system. ECMs are smaller variable speed motors that operate from a single-phase power source with an electronic controller in or on the motor. The baseline measure is a standard-efficiency motor.

Case Replacement, Low and Medium Temperatures. Efficient refrigerated display cases achieve higher performance efficiency and reduce overall energy consumption by incorporating high-performance evaporative fans (such as ECMs), energy-efficient double-pane glass doors, anti-sweat controls, high-efficiency lighting and ballasts, such as T8 or LED lamps, and improved insulation.

Commercial Refrigerator—Semivertical and Vertical—No Doors—Med Temp. This measure represents an efficient open (no doors), refrigerated, medium-temperature case, including a high-efficiency cooling unit and an optimum design to minimize energy consumption. The baseline assumes a standard-efficiency unit.

Compressor VSD Retrofit. Modulates motor speeds in response to changes in load. When low-load conditions exist, the current to the compressor motor decreases, slowing the compressor motor. The baseline is a constant-speed compressor.

Demand Control Defrost—Hot Gas. When frost collects on the evaporator, it reduces coil capacity by acting as a layer of insulation, reducing airflow between the fins. In hot gas defrost, refrigerant vapor from the compressor discharge or the high-pressure receiver warms the evaporator coil, melting frost collected there.²⁸

Display Case Motion Sensors. Savings result from a direct reduction in lighting runtimes, and a reduced cooling load from addition of display case motion sensors.²⁹

Evaporator Fan Controller. This measure adds a controller to walk-in cooler and freezer evaporator fan motors. The evaporator fan motor type is an ECM. The controller cycles motors between high and low speeds (two-speed) or on/off, when there is no call for cooling.³⁰

Floating Condenser Head Pressure Controls. This measure adds controls to float head pressures down to lower temperatures during periods of low load. The base case is a standard multiplex system, with a fixed condensing set point.

²⁸ Parker Refrigeration Specialists.

²⁹ http://www.nwcouncil.org/energy/rtf/measures/com/ComGroceryDisplayCaseLEDs_v2_1.xlsm

³⁰ http://www.nwcouncil.org/energy/rtf/measures/com/GroceryEvapFanControllerECMWalkIn_v1.xls

Glass Door ENERGY STAR Refrigerators/Freezers. “Low-E” double-pane thermal glass doors reduce cooling losses in refrigerated, reach-in cases.

Night Covers for Display Cases. Night covers help eliminate wasted refrigeration cooling by insulating display cases. In addition, they reduce heating loads of buildings through less escaped refrigerated air that must be reheated.

Refrigeration Commissioning or Recommissioning. Commissioning ensures refrigeration systems installed operate in an optimal fashion to maximize energy efficiency. Retrocommissioning checks previously commissioned equipment to ensure it continues to run efficiently. The baseline measure is no commissioning.³¹

Solid Door ENERGY STAR Refrigerators/Freezers. ENERGY STAR-labeled, commercial, solid-door refrigerators and freezers are designed with high-efficiency components, such as: ECM evaporators and condenser fan motors; hot gas, anti-sweat heaters; or high-efficiency compressors. Compared to standard models, ENERGY STAR-labeled, commercial, solid-door refrigerators and freezers save energy.³²

Strip Curtains for Walk-Ins. Strip curtains on walk-in refrigerators reduce infiltration of warm air into refrigerated spaces by improving barriers between cold spaces and ambient air.

Walk-In Electronically Commutated Motor. The walk-in fan is a refrigeration system component. ECMs are smaller, variable-speed motors, operating from a single-phase power source, with an electronic controller mounted in or on the motor. The baseline measure is a standard efficiency motor.

Water Heating

Clothes Washer Commercial, ENERGY STAR. This measure has more capacity than conventional top-load models with an agitator. Some front-loaders can wash over 20 pounds of laundry at once, compared to 10–15 pounds for a standard top-loader.³³ ENERGY STAR clothes washers have an MEF/WF of 2.43/4.0, compared to commercial 2013 federal standard clothes washers with a 1.6/8.5 MEF/WF.

Clothes Washer Residential, ENERGY STAR. ENERGY STAR-qualified residential clothes washers use less energy and water than regular washers.³⁴ ENERGY STAR residential clothes washers have an MEF/WF of 2.0/6.0, compared to residential 2011 federal standard clothes washers with a 1.26/9.0 MEF/WF.

Dishwasher Residential. Residential-sized ENERGY STAR dishwashing systems often are more appropriate for smaller commercial buildings. ENERGY STAR residential dishwashers have a maximum

³¹ <http://cbs.lbl.gov/BPA/cct.html>

³² ENERGY STAR;
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF

³³ http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers_comm

³⁴ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

consumption of 295 kWh/yr and a maximum water usage of 4.25 gal/cycle, compared to residential 2010 federal standard dishwashers with a maximum consumption of 355 kWh/yr and maximum water usage of 6.5 gal/cycle.

Dishwashing—Commercial—High Temp. ENERGY STAR high-temperature commercial dishwashers have a minimal idle rate as well as a minimal amount of water consumption per rack of loaded dishes, depending on size, and are more efficient than standard, high-temperature, commercial dishwashers.³⁵

Dishwashing—Commercial—Low Temp. ENERGY STAR low-temperature commercial dishwashers use chemicals, combined with low temperatures, to save energy when compared to standard, high-temperature, commercial dishwashers.

Domestic Hot Water Pipe Insulation. One inch of R-4 insulation, added around hot water pipes, decreases heat loss. This measure only applies for existing construction and SWH. The baseline measure is no insulation.

Drainwater Heat Recovery Water Heater. Drain water heat recovery devices recover heat energy from drain water, and use that heat to preheat cold water entering the hot water tank, minimizing the temperature rise required to achieve the set point on the water heater.³⁶

Low-Flow Faucet Aerators. Faucet aerators, mixing water and air, reduce amounts of water flowing through the faucet, creating a fine water spray through an inserted screen in the faucet head. Table D-2.40 shows flow-rate requirements for this measure.

³⁵ ENERGY STAR;
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COH

³⁶ www.toolbase.org/TechInventory/TechDetails.aspx?ContentDetailID=858&BucketID=6&CategoryID=9

Table D-2.40. Low-Flow Faucet Aerator Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.2 (Federal Code)	2.5
1.5	2.2 (Federal Code)
0.5	2.2 (Federal Code)

Low-Flow Pre-Rinse Spray Valves. Low-flow spray valves mix water and air to reduce amounts of water flowing through the spray head, which creates a fine water spray through an inserted screen in the spray head. This achieves a flow reduction of 37.5%, from a flow rate of 1.6 GPM (code) to 1.0 GPM.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead. The showerhead creates a fine water spray using an inserted screen in the showerhead. Table D-2.41 shows flow-rate requirements for this measure.

Table D-2.41. Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.5 (Federal Code)	3.0
1.5	2.5 (Federal Code)

Ultrasonic Faucet Control. Ultrasonic sensors automatically turn faucet water on and off when motion is detected at the sink, eliminating water running continuously while washing hands.

Water Cooled Refrigeration with Heat Recovery. Heat recovery gathers and uses thermal energy that normally would be rejected from the system to the ambient environment; in this case, rejected heat is utilized by the water heater.

Other

Convection Oven. Commercial ENERGY STAR electric convection ovens must meet specification requirements of 74% cooking energy-efficiency, and an idle energy rate of 1.3 kW, whereas standard electric convection ovens have a 67% cooking energy efficiency, and an idle energy rate of 1.5 kW.

Cooking Hood Controls. Utilizing sensors and two-speed or variable speed fans, hood controls reduce exhaust (and makeup) airflow when appliances do not operate at capacity (or have been turned off). The baseline for this measure would be no hood controls.

ENERGY STAR—Battery Charging System. Battery charging systems recharge a wide variety of cordless products, including power tools and small appliances. An ENERGY STAR charging system uses 35% less energy than a baseline, non-ENERGY STAR battery charger.³⁷

³⁷ http://www.energystar.gov/index.cfm?c=battery_chargers.pr_battery_chargers

ENERGY STAR—Mini-Split AC. Ductless air conditioners move heat to or from the air, cooling homes without the need for costly ductwork. This measure provides savings when compared to room air conditioners.

ENERGY STAR—Mini-Split Heat Pump. Ductless heat pumps move heat to or from the air, cooling and heating homes without the need for costly ductwork. This measure provides savings when compared to baseboard heating or room air conditioners.

ENERGY STAR—Scanners. ENERGY STAR-enabled scanners enter a low power “sleep” mode after inactivity.³⁸

ENERGY STAR—Water Cooler. ENERGY STAR coolers, providing only cold water, consume less than 0.16 kWh per day; a unit providing hot and cold water consumes less than 1.20 kWh per day. ENERGY STAR-qualified water coolers consume 45% less energy than standard models.³⁹

Fryers. Commercial, 15-inch wide, CEE-rated electric fryers have a heavy-load cooking efficiency of 80% or better, and, when idle, use less than 1,000 watts.⁴⁰ The baseline is a standard, electric deep fat fryer.

Griddle. Electric ENERGY STAR griddles operate at least 70% more efficiently. The baseline measure is a standard grill at 32% efficiency.⁴¹

Hot Food Holding Cabinet. ENERGY STAR hot food-holding cabinets use a maximum of 40 watts/cubic foot, less than the baseline measure—a conventional holding cabinet.⁴²

Ice Maker. High-efficiency commercial ice makers use high-efficiency compressors and fan motors, thicker insulation, and other measures to achieve 10% more efficiency than the baseline measure—a conventional automatic commercial ice maker.

Motor—CEE Premium-Efficiency Plus. CEE premium-efficiency motors are more efficient than standard NEMA efficiency motors.⁴³ This measure specifically relates to HVAC motors, ranging from 1 HP to 200 HP, depending on the building size.

Motor—Pump & Fan System—Variable Speed Control. Variable speed controls allow pump and fan motors to operate at lower speeds, while still maintaining set points during partial load conditions. Energy reduces when motor operation varies with load rather than runs at a constant speed.

³⁸ <http://www.energystar.gov.au/products/scanners.html>

³⁹ http://www.energystar.gov/index.cfm?c=water_coolers.pr_water_coolers

⁴⁰ http://www.energystar.gov/index.cfm?c=fryers.pr_fryers

⁴¹ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COG

⁴² http://www.energystar.gov/index.cfm?c=hfhc.pr_hfhc

⁴³ CEE (Consortium for Energy Efficiency) motor nominal efficiencies are higher than the NEMA federal minimum efficiency levels that became effective in December 2010.

Motor Rewind. When a motor fails, the user or owner faces three choices: rewind to a lower efficiency; rewind and maintain the original efficiency; or replacement with a new motor. Motor rewind follows the Green Motors Practices Group recommendations of best practices to maintain its original efficiency, commonly called a Green Rewind.^{44, 45}

Network PC Power Management. This software tool intelligently power-manages computers across a network remotely and automatically overnight, on weekends, and when not in use. This significantly lowers energy consumption without impacting user productivity. Workstations operating on a local area network (LAN) or a wide area network (WAN) can implement PC power-management policies across a LAN or WAN to maximize energy savings by placing machines into lower power states, without interfering with end-user productivity, desktop maintenance, or upgrades.

Optimized Variable Volume Lab Hood Design. Allows the volumetric flow rate to vary, which causes a constant speed through the duct, regardless of the sash opening. For buildings such as universities, schools, and hospitals using lab hoods, savings can be obtained by utilizing a variable — rather than constant—volume lab hood. The baseline measure is a constant volume lab hood.

Pool Pump Timers. This measure reduces the run time of pumps to accommodate decreased pool activity in the cooler seasons. Baseline is running a pump for eight hours a day, regardless of the season.

Residential Freezer Recycling. This refers to environmentally friendly disposal of unneeded appliances, specifically standalone freezers.

Residential Refrigerator Recycling. This refers to environmentally friendly disposal of unneeded appliances, specifically refrigerators.

Server Virtualization. Virtualization involves replacement of multiple, underutilized servers with a single server, operating at a higher utility level. Many data center servers operate at 10% of capacity or less, allowing their functions to be consolidated into “virtual” servers on one unit, operating in the range of 85% of capacity.

Smart Strips. Energy-saving products, such as power strips with an occupancy sensor, are found in workstations where power strips are commonly used. Sensor turn on and off power to all devices, such as computers, desk lights, and audio equipment, plugged into the power strip, based on occupancy within the work area.

⁴⁴ http://www.bpa.gov/energy/n/industrial/Green_motors/

⁴⁵ http://www.greenmotors.org/downloads/RTFSubmittalMay_08%20_2_.pdf

Steam Cooker. Commercial ENERGY STAR electric steam cookers have a cooking efficiency of 50%, with idle energy rates varying depending on the pan size.⁴⁶ The baseline efficiency is 35% for a standard commercial steam cooker.

6. Commercial Electric Equipment Measure Descriptions

Heating and Cooling

Air or Ground Source Heat Pump (ASHP or GSHP). Electric heat pumps move heat to or from the air or ground to cool and heat homes. Air and ground source heat pumps use a Coefficient of Performance (COP) ratio of the cooling effect produced (expressed in Btu/hr), divided by the energy input (expressed on the same basis and as an EER Ratio). Table D-2.42 displays different efficiency levels compared in this measure.

Table D-2.42. Heat Pump COP/EER Comparisons

kBTU/hr	Measure COP & EER	Baseline COP & EER
ASHP 65–135	11.5 EER, 3.4 COP	11.0 EER, 3.3 COP
ASHP 65–135	12.0 EER, 3.8 COP	11.0 EER, 3.3 COP
GSHP 65–135	16.2 EER, 4.0 COP	11.0 EER, 3.3 COP
ASHP 135–240	11.0 EER, 3.3 COP	10.6 EER, 3.2 COP
ASHP 135–240	11.5 EER, 3.4 COP	10.6 EER, 3.2 COP
GSHP 135–240	16.2 EER, 4.0 COP	10.6 EER, 3.2 COP
ASHP >240	10.0 EER, 3.3 COP	9.5 EER, 3.2 COP
ASHP >240	10.5 EER, 3.4 COP	9.5 EER, 3.2 COP
GSHP >240	16.2 EER, 4.0 COP	9.5 EER, 3.2 COP

Centrifugal Chiller. A centrifugal chiller utilizes the vapor compression cycle to chill water and reject heat collected from the chilled water, plus heat from the compressor moves to a second water loop, cooled by a cooling tower. The advantage of centrifugal compressors is they have high flow rates capabilities and good efficiency characteristics. This measure compares different efficiencies, greater than 300 tons and rated in kW/ton, as shown in Table D-2.43.

⁴⁶ http://www.energystar.gov/index.cfm?c=steamcookers.pr_steamcookers

Table D-2.43. Centrifugal Chiller kW/ton Comparison

Measure kW/ton	Baseline kW/ton
0.55	0.576
0.52	0.576
0.47	0.576

Screw Chiller. Screw compressors are positive displacement devices. The refrigerant chamber is actively compressed to a smaller volume by the twisting motion of two, interlocking, rotating screws. Refrigerant trapped in the space enclosed between the two rotating screws is compressed as it makes its way from the inlet to the outlet of the compressor. A slide valve adjusts the compression effect by varying the amount of compression occurring before refrigerant is discharged. Screw chillers generally are used for small to medium-sized buildings. This measure compares different efficiencies, rated in kW/ton, as shown in Table D-2.44.

Table D-2.44. Screw Chiller kW/ton Comparison

Tons	Measure kW/ton	Baseline kW/ton
<150	0.71	0.775
<150	0.63	0.775
<150	0.58	0.775
150-300	0.63	0.68
150-300	0.58	0.68
150-300	0.52	0.68

DX Package. DX systems use a refrigerant piping circuit, compressor, and refrigerant coils to transfer heat. A single package, typically installed on the building roof, contains all the components. As a measurement of efficiency, commercial-sized units are normally rated as an Energy Efficient Ratio (EER). Table D-2.45 displays the different models compared in this measure.

Table D-2.45. DX AC Unit EER/Advanced Technology Comparisons

kBTU/hr	Measure EER	Baseline EER
65–135	11.5	11.2
65–135	12.0	11.2
135–240	11.5	11.0
135–240	12.0	11.0
240–760	10.5	10.0
240–760	10.8	10.0

Evaporative Cooler, Replaces DX Package. Evaporative coolers, also known as swamp coolers, cool air through simple evaporation of water. Evaporative cooling differs from standard air conditioning, which uses vapor-compression or absorption refrigeration cycles.⁴⁷ This measure replaces a DX package.

⁴⁷ http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12360

Packaged Terminal Air Conditioner (PTAC) (10,000 BTU/HR). PTAC units house all components—compressor; condenser and evaporator coils; expansion device; condenser and evaporator fans; and associated operating and control devices—within a single cabinet. In most cases, this package unit is installed within a space and through the wall, as in the lodging segment. The baseline for this measure is a 10.4 EER, upgraded to an 11.4 EER PTAC.

Lighting

Lighting Interior Fluorescent. This measure upgrades fluorescent lighting fixtures to a more efficient lighting technology. A lumen equivalence is used to avoid changing the lighting level by varying the number of fixtures during the upgrade process. If the lumen equivalence happens to be within 10% of the baseline lumens, however, the number of fixtures remains constant. This measure only applies to existing construction. Table D-2.46 displays the different models compared in this measure.

Table D-2.46. Fluorescent Lighting Comparison

Measure	Baseline
Reduced Wattage T8	T8
High Performance T8	T8
T5	T8

Lighting Interior High Intensity Discharge (HID) and High Bay. This measure represents upgrading HID and high-bay lighting fixtures to more efficient lighting technologies. A lumen equivalence is used to avoid changing the lighting level by varying the number of fixtures during the upgrade process. If the lumen equivalence happens to be within 10% of the baseline lumens, however, the number of fixtures remains constant. This measure only applies to existing construction. Table D-2.47 displays the different models compared in this measure.

Table D-2.47. HID and High Bay Lighting Comparison

Measure	Baseline
Metal Halide	High Pressure Sodium
Induction	High Pressure Sodium
Efficient Metal Halide	High Pressure Sodium
LED	High Pressure Sodium
T5 High Output	High Pressure Sodium

Lighting Interior Screw Base. This measure upgrades screw-based lighting fixtures to a more efficient lighting technology. A lumen equivalence is used to avoid changing the lighting level by varying the number of fixtures during the upgrade process. If the lumen equivalence happens to be within 10% of the baseline lumens, however, the number of fixtures remains constant. This measure only applies to existing construction. Table D-2.48 displays the different models compared in this measure.

Table D-2.48. Screw Base Lighting Comparison

Measure	Baseline
---------	----------

CFL	Incandescent
LED	Incandescent
CFL	EISA Incandescent
LED	EISA Incandescent

Lighting Package, High Efficiency. This measure represents the achievable lighting percentage decrease in lighting power density. The baseline lighting technology is representative of all available technologies making up the total watts per square foot for that particular building type. This includes all overhead lighting (e.g., T12, T8, T5 tubes, canned CFLs). The lighting reduction package measures reduce the lighting power density (W/sqft) by installing higher-efficiency technologies, such as high-performance

T8 or T5 tubes, high-efficiency ballasts, and reflective lighting fixtures. This measure only applies to new construction.

Water Heating

Storage and Heat Pump Water Heater. High-efficiency water heaters operate more efficiently than standard electric water heaters due to reduced standby losses. Table D-2.49 shows baseline and efficient measure EF values.

Table D-2.49. Water Heater EF Comparisons

Water Heater Capacity	Measure EF	Baseline EF
≤ 55 Gallons	Heat Pump Water Heater = 2.0	2004 Federal Standard = 0.92
≤ 55 Gallons	Heat Pump Water Heater = 2.0	2015 Federal Standard = 0.95
> 55 Gallons	Heat Pump Water Heater = 2.0	2004 Federal Standard = 0.87
> 55 Gallons	Heat Pump Water Heater = 2.0	2015 Federal Standard = 1.97

Other

Computer—ENERGY STAR. ENERGY STAR computers consume less than 2 watts in “sleep” and “off” modes, and operate more efficiently than conventional units in “idle” mode, resulting in 32% energy savings.

Copiers—ENERGY STAR. ENERGY STAR copiers deliver the same performance as conventional equipment, operate, on average, 27% more efficiently, and power down when not in use. The baseline measure is a non-ENERGY STAR copier.⁴⁸

Fax—ENERGY STAR. ENERGY STAR fax machines enter sleep mode after inactivity, reducing their total power consumption by 50%.⁴⁹

⁴⁸ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CP

⁴⁹ http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf

Freezer—Residential. ENERGY STAR-qualified freezers use at least 10% less energy than standard models due to improvements in insulation and compressors. This measure considers the change in 2015 federal standard efficiency levels. Table D-2.50 shows the baseline and efficient measures.

Table D-2.50. Freezers Comparison

Measure	Baseline
ENERGY STAR	Federal Standard 2001
ENERGY STAR	Federal Standard 2015

Monitors—ENERGY STAR. ENERGY STAR monitors feature the following: (1) an “on” mode, where the maximum allowed power varies, based on the computer monitor’s resolution; (2) a “sleep” mode, where computer monitor models must consume 2 watts or less; and (3) an “off” mode, where computer monitor models must consume 1 watt or less. The baseline equipment does not include these features.⁵⁰

Printers—ENERGY STAR. ENERGY STAR printers deploy a maximum time delay to sleep, depending upon the equipment’s size. This reduces power consumption during inactive periods, resulting in 37% energy savings.⁵¹

Refrigerator—Residential. ENERGY STAR and CEE-qualified refrigerators use at least 20% less energy than standard models, due to improvements in insulation and compressors. This measure considers the change in 2015 federal standard efficiency and two CEE tiers above ENERGY STAR. Table D-2.51 shows the baseline and efficient measures.

⁵⁰ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.ShowProductGroup&pgw_code=MO

⁵¹ http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf

Table D-2.51. Refrigerator Comparison

Measure	Baseline
ENERGY STAR/CEE Tier 1	Federal Standard 2001
CEE Tier 2	Federal Standard 2001
CEE Tier 3	Federal Standard 2001
ENERGY STAR/CEE Tier 1	Federal Standard 2015
CEE Tier 2	Federal Standard 2015
CEE Tier 3	Federal Standard 2015

Server—ENERGY STAR. Servers must meet energy use guidelines in “off” (less than 2 watts) and “idle” (either 50 watts or 65 watts, according on the category) modes of operation, ensuring energy savings when computers are used and performing a range of tasks as well as when turned off or in a low-power mode.⁵²

Vending Machines—High Efficiency. ENERGY STAR new and rebuilt refrigerated beverage vending machines operate 36% more energy efficiently than standard models, using more efficient compressors, fan motors, lighting systems, and low-power mode options during non-use periods.⁵³

7. Commercial Natural Gas Retrofit Measure Descriptions

Heating and Cooling

Automated Ventilation (VFD) Control (Occupancy Sensors/CO₂ sensors). This measure is also known as DCV, where the ventilation system automatically adjusts air flow when CO₂ rises above a specified level. CO₂ controls maintain a minimum ventilation rate at all times to control non-occupant contaminants, such as off-gassing from furniture, equipment, and building components. The baseline of this measure is a ventilation system that runs constantly.

Boiler Economizer. This measure recovers heat energy that would otherwise be lost out a boiler stack by using a heat exchanger located on the stack, to preheat boiler feed water.

Boiler—Pipe Insulation. Adding insulation around pipes decreases heat loss. The baseline is a boiler pipe with 1 inch of insulation. Table D-2.52 shows thicknesses of pipe insulation compared in this measure.

Table D-2.52. Boiler Pipe Insulation Levels

Measure Thickness	Baseline Thickness
2 in (Code)	1 in (Existing)
3 in	2 in (Code)

Boiler Reset Controls. Boiler controls systems have microprocessor controls that anticipate heating load demand by calculating rates of system temperature or pressure changes. Controls also provide

⁵² http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CO

⁵³ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=VMC

adjustable reset points for setback and programmable time clock controls. The baseline assumes no controls.⁵⁴

Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The baseline measure is no commissioning.

Convert Constant Volume Air System to VAV. The VAV allows the airflow volume of a HVAC system to vary heating or cooling loads rather than over-conditioning and short-cycling. The baseline in this case is a constant volume system.

Direct Digital Control System-Installation. DDC systems allow both HVAC and lighting to be controlled and monitored. For lighting, the DDC system allows for direct control of lights from a remote location. Entire HVAC systems, including pumps, motors, fans, and set points, can be digitally programmed for tighter control of the system.

Duct Repair and Sealing. The repair and sealing of leaky ducts creates significant energy savings by ensuring conditioned air goes only to occupied spaces, thereby reducing excessive runtimes/loads on HVAC systems.

Exhaust Air to Ventilation Air Heat Recovery. Captures air exhausted out of a building during the heating season, which would be warmer than the air outside. Transferring this heat to incoming air lowers overall heating loads.

Exhaust Hood Makeup Air. Provides exhaust air at the hood instead of allowing the hood to exhaust conditioned air in the room. The baseline measure is conditioned air expelled through exhaust hoods.

Infiltration Reduction. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. The baseline measure is 1.00 ACH, while the measure value is 0.65 ACH.

Insulation—Ceiling. These measures represent an increase in an R-value from existing building conditions to current state code, and from current state code to better-than-code R-value improvements. Table D-2.53 presents baseline and measure values.

⁵⁴ <http://energyexperts.org/EnergySolutionsDatabase/ResourceDetail.aspx?id=1579>

Table D-2.53. Ceiling Insulation Measures

Measure	Baseline
R-20ci (KY State Code)	Average Existing Conditions
R-30	R-20ci (KY State Code)

Insulation—Duct. Packaged DX and heat-pump equipment generally are coupled with a ducting system inside a building. Insulating ducts reduces energy loss in unoccupied plenum space. Table D-2.54 presents baseline and measure values.

Table D-2.54. Duct Insulation Measures

Measure	Baseline
R-5 (KY State Code)	Average Existing Conditions
R-8	R-5 (KY State Code)

Insulation—Floor (Non-slab). These measures represent an R-value increase from existing building conditions to current state code, and from current state code to better than code R-value improvements for the floor space (non-slab). Table D-2.55 presents baseline and measure values.

Table D-2.55. Floor Insulation Measures

Measure	Baseline
R-30 (KY State Code)	Average Existing Conditions
R-38	R-30 (KY State Code)

Insulation—Wall. These measures represent an increase in the R-value to current state code values or better. Table D-2.56 presents baseline and measure values.

Table D-2.56. Wall Insulation Measures

Measure	Baseline
R-13 + 7.5 (KY State Code)	Average Existing Conditions
R-13 + 10	R-13 + 7.5 (KY State Code)

Re-Commissioning. The commissioning process can be applied to existing buildings to restore them to optimal performance. Retrocommissioning is a systematic, documented process, identifying low-cost operational and maintenance improvements in existing buildings, bringing the buildings up to the design intentions of its current operation.^{55,56} The baseline measure is no commissioning.

Tune-up—Boiler and Furnace Maintenance. Proper system maintenance and tune-ups ensure clean burners, combustion chambers, and heat exchange surfaces. Flame colors are checked for proper burning. Other items checked include: fan belts, blowers, safety controls, the rmostat operations, proper venting, and filters. All motors are lubricated, and a combustion efficiency test is performed. Properly maintaining an existing unit keeps efficiency at the highest level possible.

⁵⁵ <http://www.green.ca.gov/CommissioningGuidelines/default.htm>

⁵⁶ <http://cbs.lbl.gov/BPA/cct.html>

Windows-High Efficiency. This measure represents an increase in building performance by reducing the U-value in existing construction and new construction windows, as shown in Table D-2.57.

Table D-2.57. High-Efficiency Window Measures

Measure U-Value	Baseline U-Value
U-0.40 (KY State Code)	Average Existing Condition
U-0.32	U-0.40 (KY State Code)

Water Heating

Clothes Washer Commercial, ENERGY STAR. This measure has greater capacity than conventional top-load models with an agitator. Some front-loaders can wash over 20 pounds of laundry at once, compared to 10 to 15 pounds for a standard top-loader.⁵⁷ ENERGY STAR commercial clothes washers have an MEF/WF of 2.43/4.0, compared to commercial, 2013, federal-standard clothes washers with a 1.6/8.5 MEF/WF.

Clothes Washer Residential, ENERGY STAR. ENERGY STAR-qualified residential clothes washers use less energy and water than regular washers.⁵⁸ ENERGY STAR residential clothes washers have an MEF/WF of 2.0/6.0, compared to residential, 2011, federal-standard clothes washers with a 1.26/9.0 MEF/WF.

Dishwasher Residential. Residential-sized ENERGY STAR dishwashing systems often prove more appropriate for smaller commercial buildings. ENERGY STAR residential dishwashers have an maximum consumption of 295 kWh/yr and maximum water usage of 4.25 gal/cycle, compared to residential, 2010, federal-standard dishwashers, with a maximum consumption of 355 kWh/yr and maximum water usage of 6.5 gal/cycle.

Demand Controlled Circulating Systems. A demand-controlled circulating system only circulates hot water when required. The baseline measure is a continuously circulating hot water system, resulting in energy loss through pipes.

Dishwashing—Commercial—High Temp. ENERGY STAR high-temperature commercial dishwashers have a minimal idle rate as well as a minimal amount of water consumption per rack of loaded dishes, depending on size, and operate more efficiently than standard, high-temperature, commercial dishwashers.⁵⁹

Dishwashing—Commercial—Low Temp. ENERGY STAR low-temperature commercial dishwashers use chemicals, combined with low temperatures, to save energy when compared to standard, high-temperature, commercial dishwashers.

⁵⁷ http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers_comm

⁵⁸ http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

⁵⁹ ENERGY STAR;
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COH

Domestic Hot Water Pipe Insulation. One inch of R-4 insulation, added around hot water pipes, decreases heat loss. This measure only applies for existing construction and SWH. The baseline measure is no insulation.

Drainwater Heat Recovery Water Heater. Drainwater heat recovery devices recover heat energy from drainwater, and use the heat to preheat cold water entering the hot water tank, minimizing the temperature rise required to achieve the set point on the water heater.⁶⁰

Low-Flow Faucet Aerators. Faucet aerators, mixing water and air, reduce amounts of water flowing through the faucet, creating a fine water spray through a screen inserted in the faucet head.

Table D-2.58 shows flow-rate requirements for this measure.

Table D-2.58. Low-Flow Faucet Aerator Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.2 (Federal Code)	2.5
1.5	2.2 (Federal Code)
0.5	2.2 (Federal Code)

Low-Flow Pre-Rinse Spray Valves. Low-flow spray valves mix water and air to reduce amounts of water flowing through a spray head, which creates a fine water spray through a screen inserted in the spray head. This achieves a flow reduction of 37.5%, from a flow rate of 1.6 GPM (code) to 1.0 GPM.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead. The showerhead creates a fine water spray using an inserted screen in the showerhead. Table D-2.59 shows flow-rate requirements for this measure.

⁶⁰ www.toolbase.org/TechInventory/TechDetails.aspx?ContentDetailID=858&BucketID=6&CategoryID=9

Table D-2.59. Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.5 (Federal Code)	3.0
1.5	2.5 (Federal Code)

Water Cooled Refrigeration with Heat Recovery. Heat recovery gathers and uses thermal energy that normally would be rejected from the system to the ambient environment; in this case, a water heater utilizes the rejected heat.

Other

Broiler. High-efficiency broiler ovens have rigorous start-up, shut down, and turn-down schedules for additional energy savings over standard units. Improved efficiency broilers have an efficiency of 34%, compared to baseline models at 15%.

Convection Oven. Commercial ENERGY STAR electric convection ovens must meet specification requirements of 74% cooking energy-efficiency, and an idle energy rate of 1.3 kW, whereas standard electric convection ovens have a 67% cooking energy efficiency, and an idle energy rate of 1.5 kW.

Conveyor Oven. A high-efficiency conveyor oven operates at 23% efficiency, compared to a standard conveyor oven at 15% efficiency.

Integrated Space Heating/Water Heating. These systems provide space conditioning and hot water heating in one appliance/energy source. Domestic hot water is heated directly, and space is heated by a hot water heat exchanger coil piped to the forced air heating system. This combination space/water heating system provides high-efficiency heating for the cost of one high-efficiency appliance.

Fryers. These measures operate at 50% efficiency, and when idle use less than 9,000 Btu/hr.⁶¹ The baseline efficiency is 35% for a non-ENERGY STAR® commercial fryer.

Griddle. This measure is approximately 10% more efficient than standard models, and must have a minimum cooking efficiency of 38%. They must use less than 0.026 therm/hour/ft² when idle. The baseline measure is a standard grill at 32% efficiency.⁶²

Swimming Pool/Spa Covers. This measure reduces evaporation, which is the largest source of pool/spa energy loss. It takes one British thermal unit (Btu) to raise one pound of water by 1 degree. Each pound of 80° F water that evaporates takes 1,048 Btus of heat out of the pool.⁶³ The baseline measure is an uncovered pool or spa.

⁶¹ http://www.energystar.gov/index.cfm?c=fryers.pr_fryers

⁶² http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COG

⁶³ http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=13140

8. Commercial Natural Gas Equipment Measure Descriptions

Heating and Cooling

Gas Boiler. Boilers are classified as condensing or non-condensing. Condensing boilers condense the flue gas and water vapor, extracting useful heat and improving the boiler efficiency. This measure compares several boilers with different thermal efficiencies, and is applicable to new and existing construction. The boiler's overall efficiency is defined as the gross energy output divided by the energy input, and is affected by combustion efficiency, standby losses, cycling losses, and heat transfer. Table D-2.60 displays the measure and baseline efficiencies.

Table D-2.60. Gas Boiler Efficiency Comparison

kBTU/hr	Measure	Baseline
<300	90% AFUE	82% AFUE
<300	94% AFUE	82% AFUE
<300	96% AFUE	82% AFUE
≥300 to 2,500	85% Thermal Efficiency	75% Thermal Efficiency
≥300 to 2,500	95% Thermal Efficiency	75% Thermal Efficiency

Gas Furnace. Improvements in furnace technology, such as new ignition and heat exchange design, have led to increased furnace efficiency. Table D-2.61 shows the AFUE levels considered in this measure.

Table D-2.61. Gas Furnace Efficiency Comparison

Measure AFUE	Baseline AFUE
92%	90%
94%	90%
96%	90%

Water Heating

Water Heater. High-efficiency water heaters operate more efficiently than standard gas water heaters due to reduced standby losses. Table D-2.62 shows baseline and efficient measure EF values.

Table D-2.62. Water Heater EF Comparisons

Water Heater Capacity	Measure EF	Baseline EF
≤ 55 Gallons	Water Heater = 0.62	2004 Federal Standard = 0.594
≤ 55 Gallons	Water Heater = 0.67	2004 Federal Standard = 0.594
≤ 55 Gallons	Tankless Water Heater = 0.82	2004 Federal Standard = 0.594
≤ 55 Gallons	Condensing Water Heater = 0.90	2004 Federal Standard = 0.594
≤ 55 Gallons	Water Heater = 0.62	2015 Federal Standard = 0.615
≤ 55 Gallons	Water Heater = 0.67	2015 Federal Standard = 0.615
≤ 55 Gallons	Tankless Water Heater = 0.82	2015 Federal Standard = 0.615
≤ 55 Gallons	Condensing Water Heater = 0.90	2015 Federal Standard = 0.615
> 55 Gallons	Water Heater = 0.62	2004 Federal Standard = 0.528
> 55 Gallons	Water Heater = 0.67	2004 Federal Standard = 0.528
> 55 Gallons	Condensing Water Heater = 0.85	2004 Federal Standard = 0.528
> 55 Gallons	Condensing Water Heater = 0.85	2015 Federal Standard = 0.743

Appendix E. Detailed Results

The following pie charts show achievable potential distributed by fuel, sector, segment, and end use.

Figure E.1 Electric Achievable Economic Potential: Residential by Segment

Total: 920,185 MWh

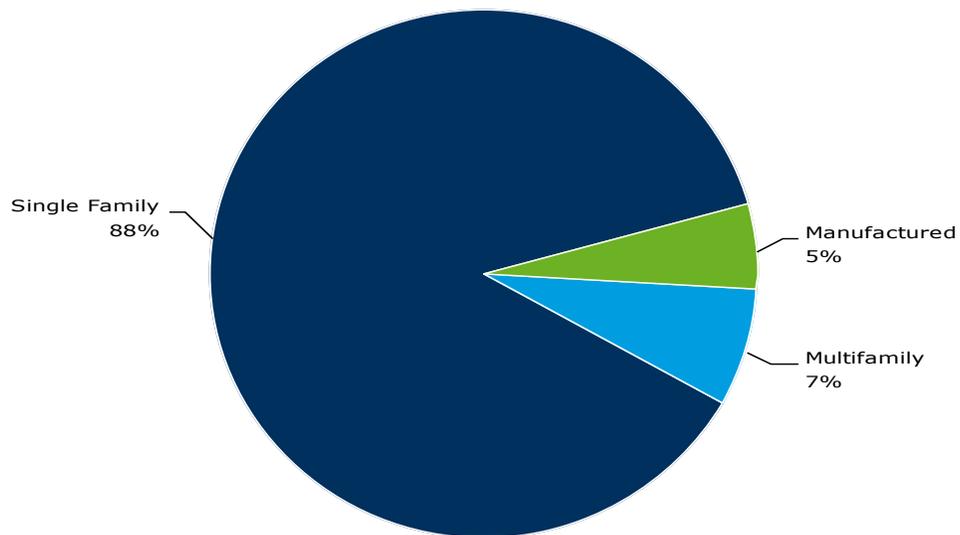
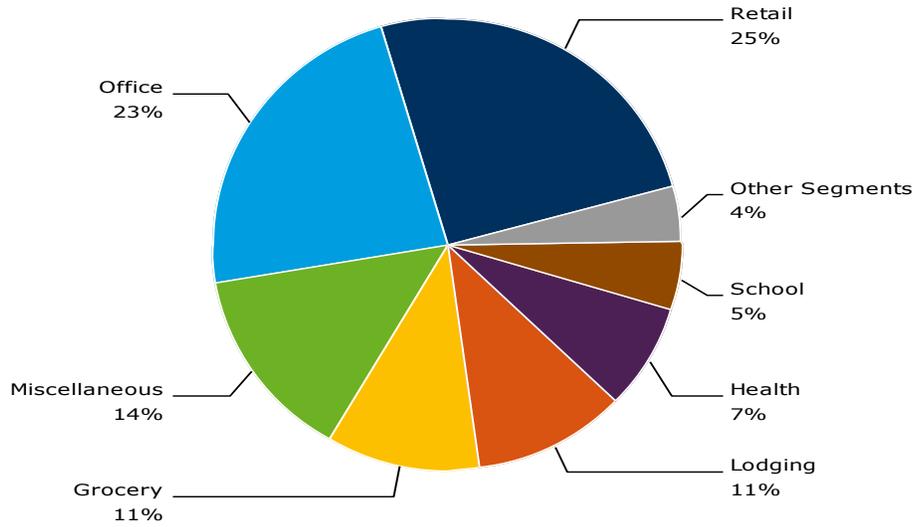


Figure E.2 Electric Achievable Economic Potential: Commercial by Segment

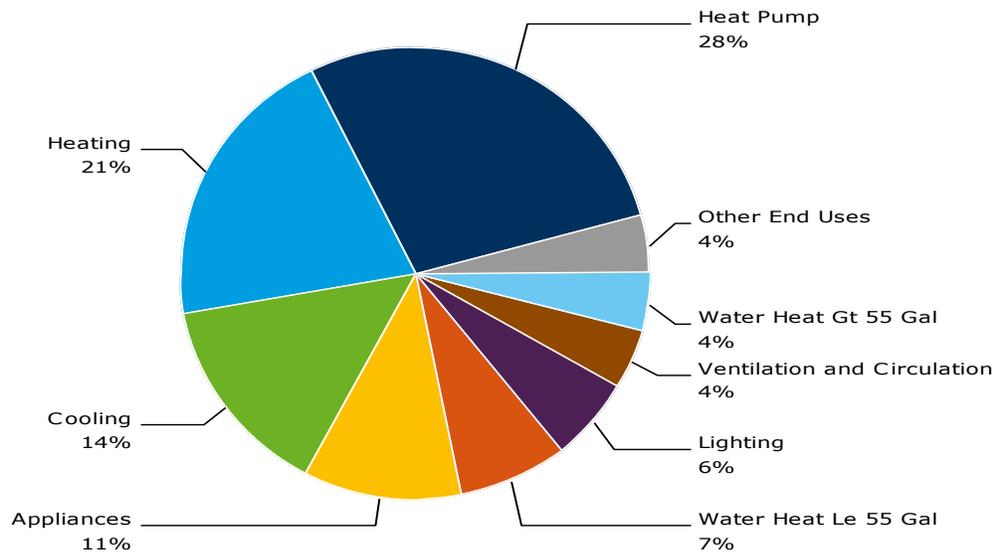
Total: 461,670 MWh



Note: 'Other Segments' includes:
 Restaurant: 3%, Warehouse: 1%

Figure E.3 Electric Achievable Economic Potential: Residential by End Use

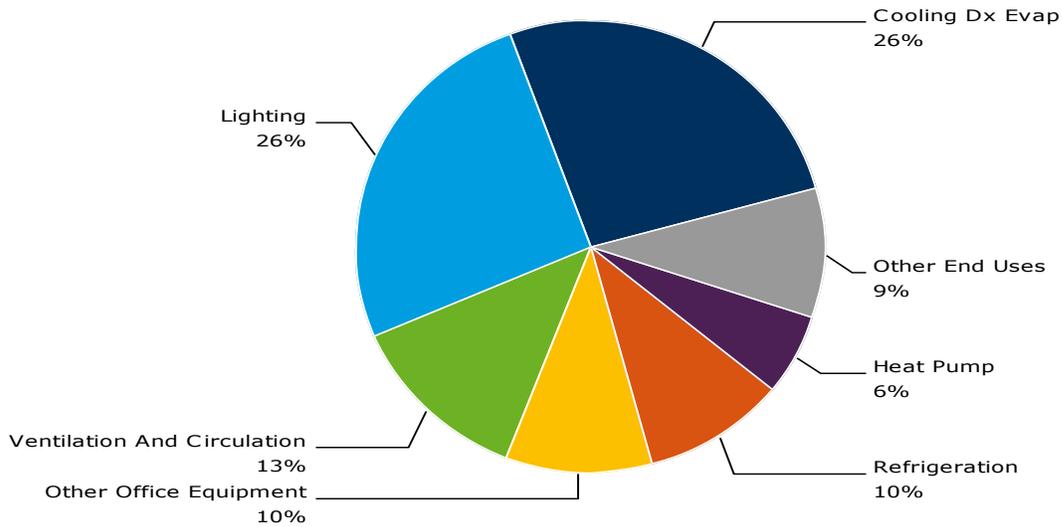
Total: 920,185 MWh



Note: 'Other End Uses' includes:
 Plug Load: 4%, Pool Pump: <1%

Figure E.4 Electric Achievable Economic Potential: Commercial by End Use

Total: 461,670 MWh

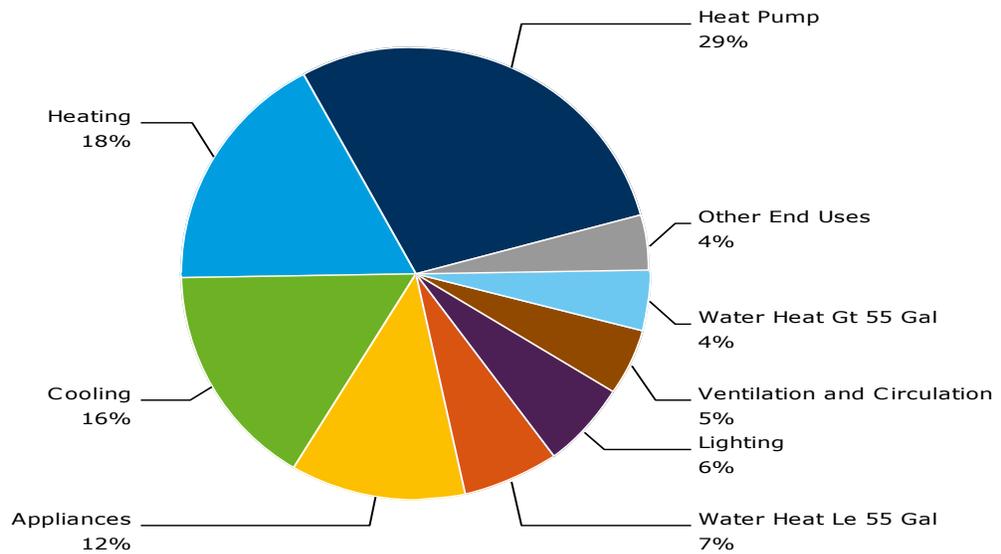


Note: 'Other End Uses' includes:

Pool Pump: 3%, Package Terminal Hp: 2%, Cooling: 2%, Water Heat Le 55 Gal: 1%, Appliances: 1%, Water Heat Gt 55 Gal: <1%, Lighting Interior Hid: <1%, Room Cool: <1%, Package Terminal Ac: <1%, Cooking: <1%, Heating: <1%, Room Heat: <1%

Figure E.5 Electric Achievable Economic Potential: Residential Single Family by End Use

Total: 806,635 MWh

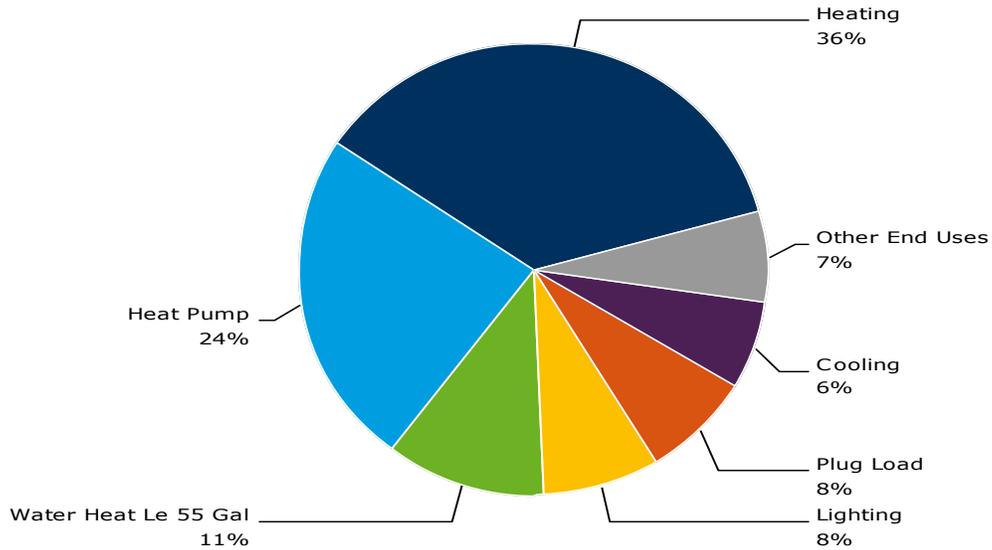


Note: 'Other End Uses' includes:

Plug Load: 4%, Pool Pump: <1%

Figure E.6 Electric Achievable Economic Potential: Residential Multifamily by End Use

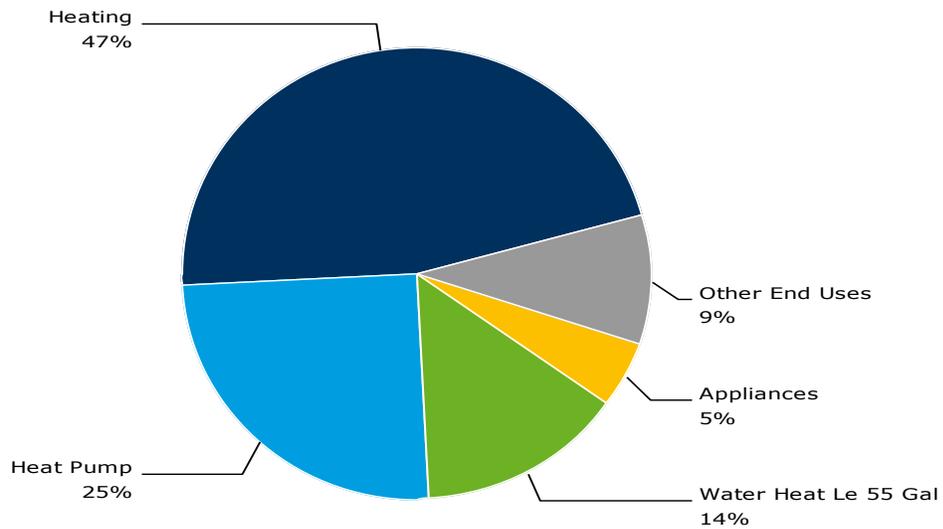
Total: 65,257 MWh



Note: 'Other End Uses' includes:
 Water Heat Gt 55 Gal: 4%, Appliances: 3%

Figure E.7 Electric Achievable Economic Potential: Residential Manufactured by End Use

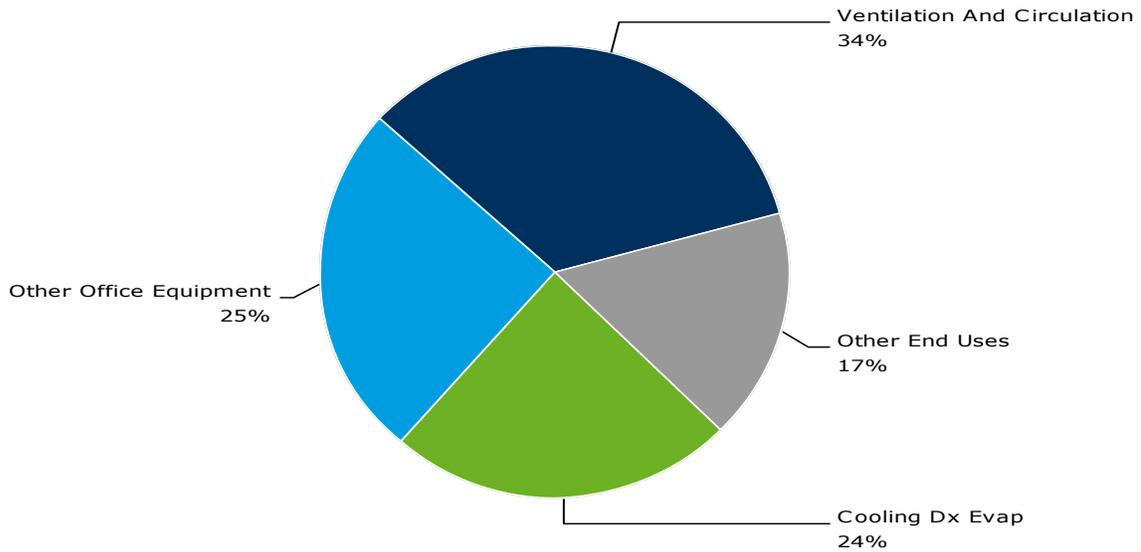
Total: 48,293 MWh



Note: 'Other End Uses' includes:
 Lighting: 3%, Plug Load: 2%, Water Heat Gt 55 Gal: 2%, Cooling: 2%

Figure E.8 Electric Achievable Economic Potential: Commercial School by End Use

Total: 22,879 MWh

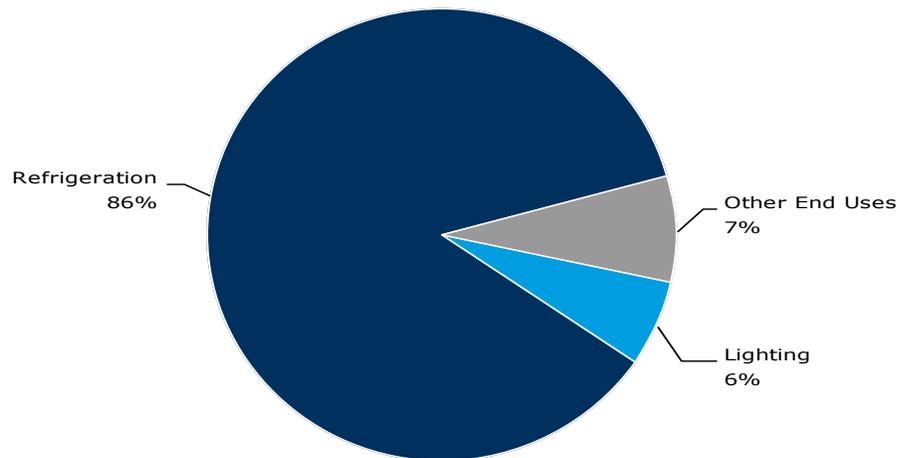


Note: 'Other End Uses' includes:

Heat Pump: 4%, Lighting: 3%, Water Heat Le 55 Gal: 2%, Appliances: 2%, Cooling: 2%, Pool Pump: 1%, Water Heat Gt 55 Gal: 1%, Refrigeration: <1%, Lighting Interior Hid: <1%, Room Cool: <1%, Cooking: <1%

Figure E.9 Electric Achievable Economic Potential: Commercial Grocery by End Use

Total: 49,160 MWh

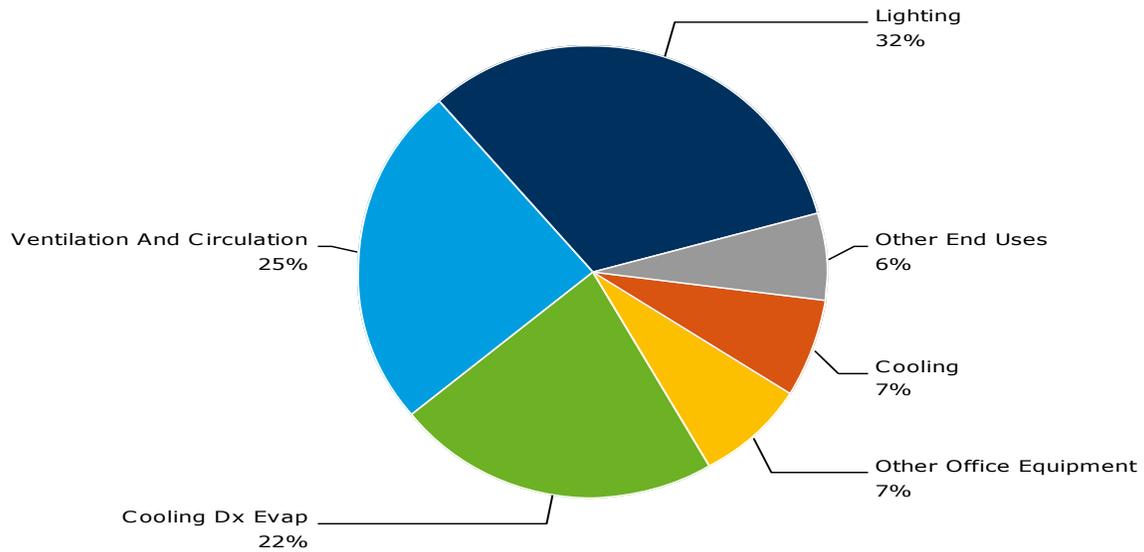


Note: 'Other End Uses' includes:

Cooling Dx Evap: 2%, Heat Pump: 2%, Ventilation And Circulation: 1%, Other Office Equipment: <1%, Lighting Interior Hid: <1%, Appliances: <1%, Cooking: <1%, Heating: <1%, Water Heat Le 55 Gal: <1%, Room Heat: <1%, Room Cool: <1%, Water Heat Gt 55 Gal: <1%

Figure E.10 Electric Achievable Economic Potential: Commercial Health by End Use

Total: 34,470 MWh

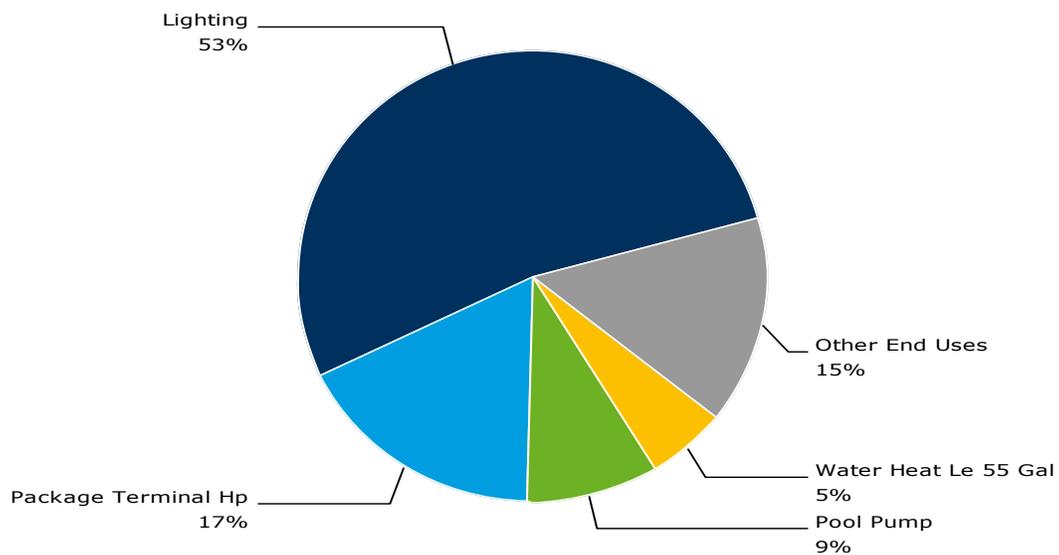


Note: 'Other End Uses' includes:

Heat Pump: 4%, Refrigeration: <1%, Appliances: <1%, Water Heat Le 55 Gal: <1%, Water Heat Gt 55 Gal: <1%, Lighting Interior Hid: <1%, Room Cool: <1%, Cooking: <1%

Figure E.11 Electric Achievable Economic Potential: Commercial Lodging by End Use

Total: 48,723 MWh

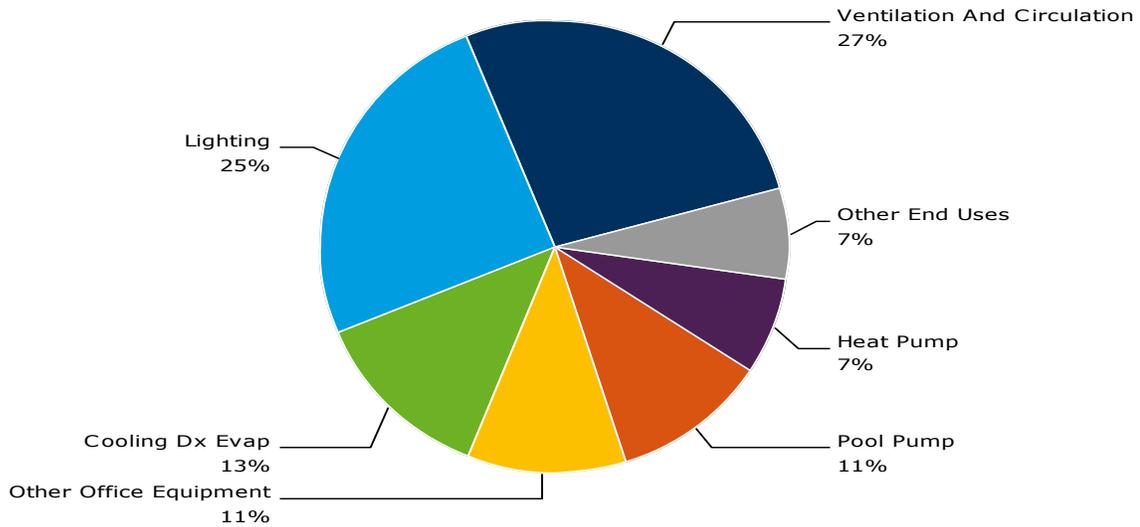


Note: 'Other End Uses' includes:

Other Office Equipment: 4%, Cooling Dx Evap: 3%, Water Heat Gt 55 Gal: 2%, Appliances: 2%, Heat Pump: 2%, Cooling: 1%, Package Terminal Ac: <1%, Cooking: <1%, Lighting Interior Hid: <1%

Figure E.12 Electric Achievable Economic Potential: Commercial Miscellaneous by End Use

Total: 64,254 MWh

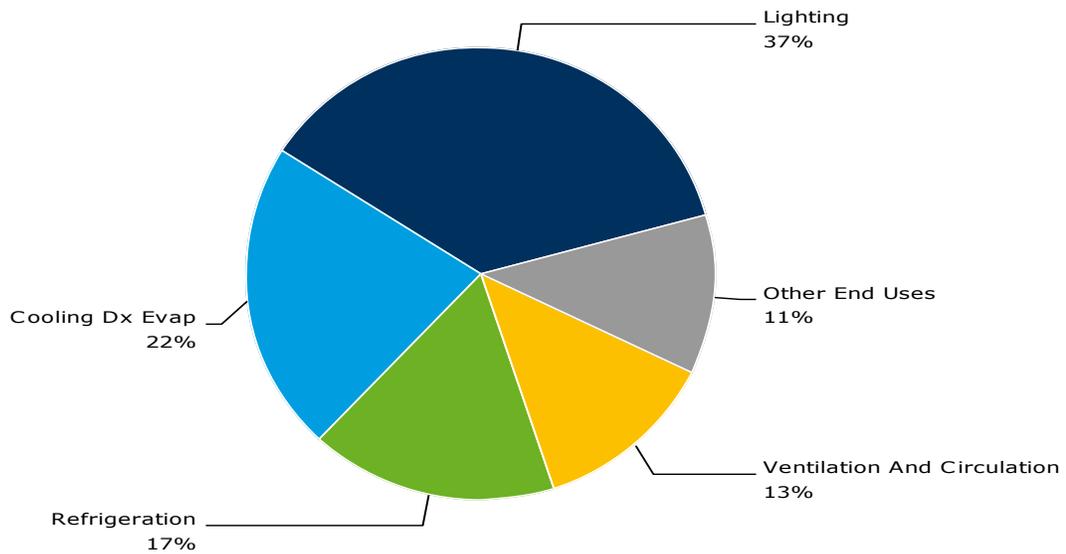


Note: 'Other End Uses' includes:

Cooling: 2%, Appliances: 2%, Lighting Interior Hid: 1%, Water Heat Le 55 Gal: <1%, Refrigeration: <1%, Package Terminal Hp: <1%, Water Heat Gt 55 Gal: <1%, Package Terminal Ac: <1%, Cooking: <1%

Figure E.15 Electric Achievable Economic Potential: Commercial Restaurant by End Use

Total: 12,710 MWh

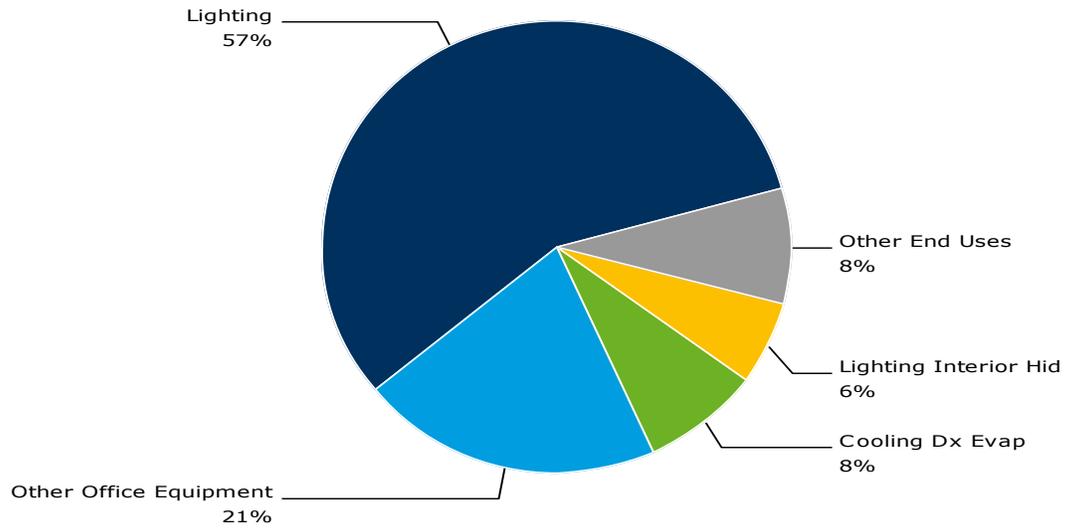


Note: 'Other End Uses' includes:

Heat Pump: 3%, Appliances: 3%, Other Office Equipment: 2%, Water Heat Le 55 Gal: 2%, Water Heat Gt 55 Gal: 1%, Cooking: 1%, Lighting Interior Hid: <1%

Figure E.18 Electric Achievable Economic Potential: Commercial Warehouse by End Use

Total: 5,512 MWh



Note: 'Other End Uses' includes:

Water Heat Le 55 Gal: 3%, Appliances: 2%, Water Heat Gt 55 Gal: 1%, Cooling: <1%, Room Cool: <1%, Heat Pump: <1%

Figure E.19 Gas Achievable Economic Potential: Residential by Segment

Total: 16,694,924 Therms

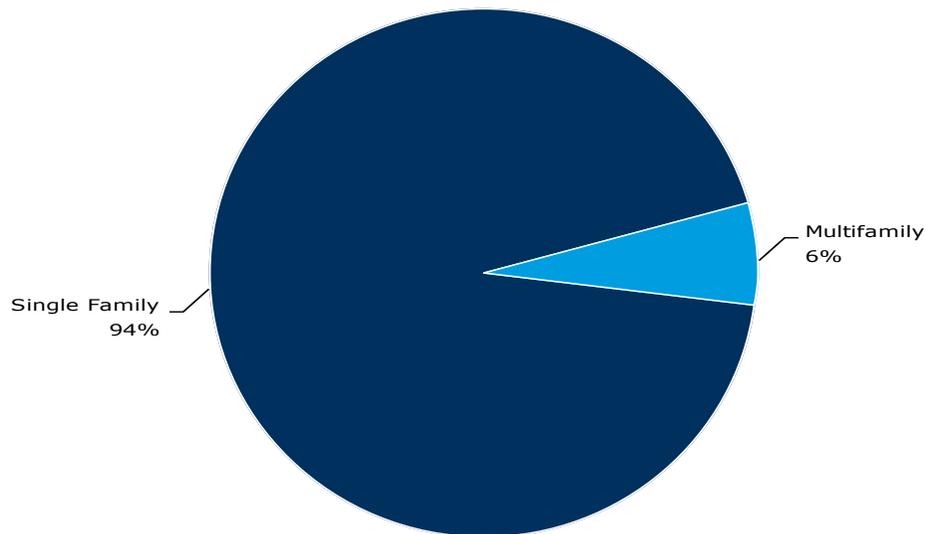
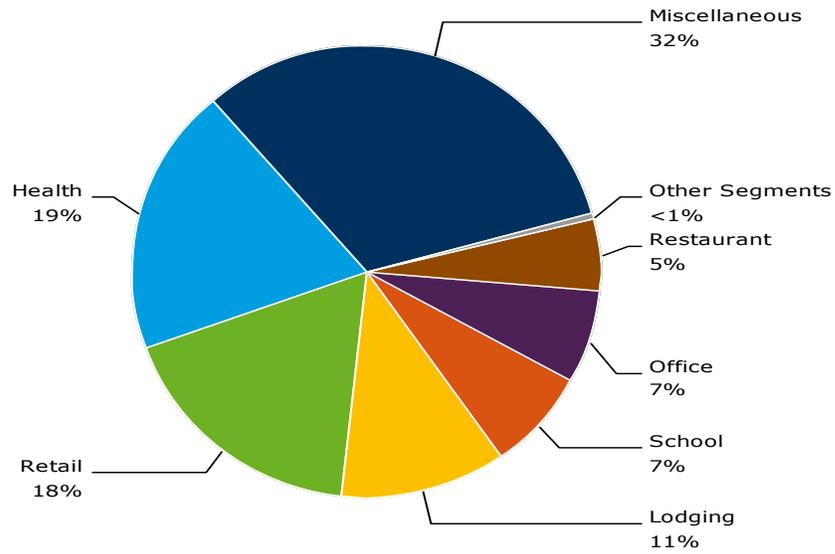


Figure E.20 Gas Achievable Economic Potential: Commercial by Segment

Total: 7,602,697 Therms



Note: 'Other Segments' includes:
Grocery: <1%, Warehouse: <1%

Figure E.21 Gas Achievable Economic Potential: Residential by End Use

Total: 16,694,924 Therms

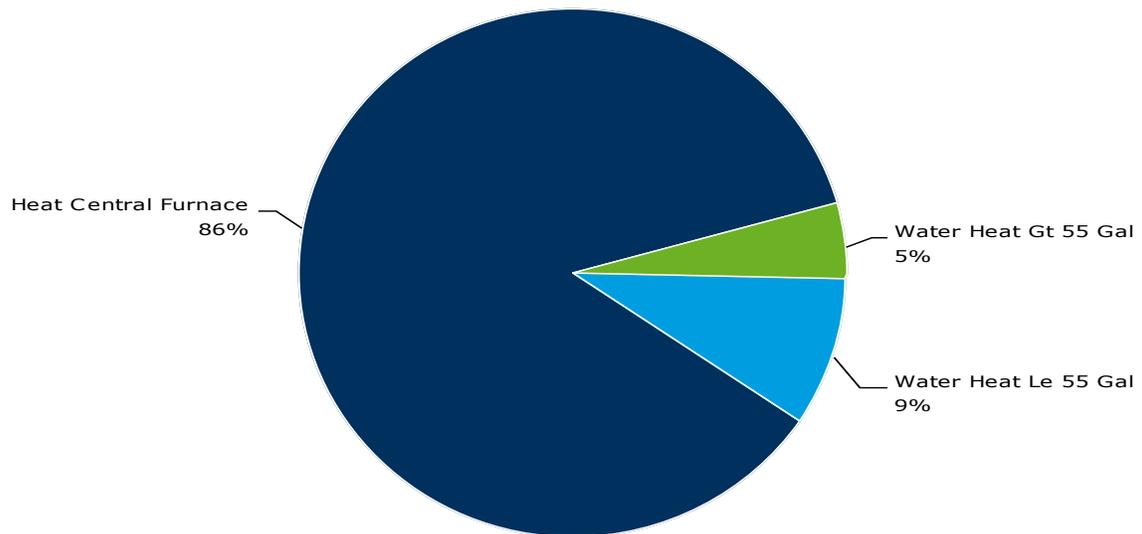
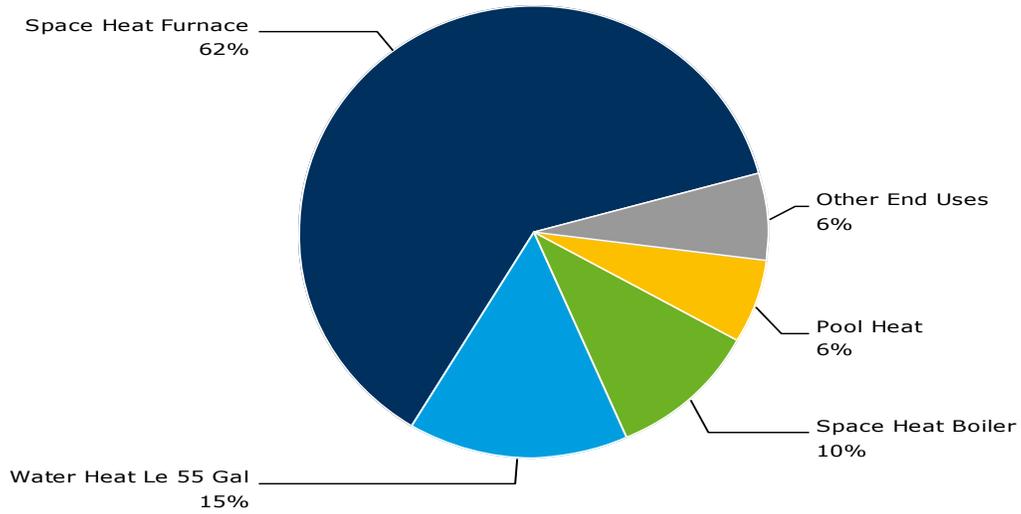


Figure E.22 Gas Achievable Economic Potential: Commercial by End Use

Total: 7,602,697 Therms



Note: 'Other End Uses' includes:
 Water Heat Gt 55 Gal: 4%, Cooking: 2%

Figure E.23 Gas Achievable Economic Potential: Residential Single Family by End Use

Total: 15,662,979 Therms

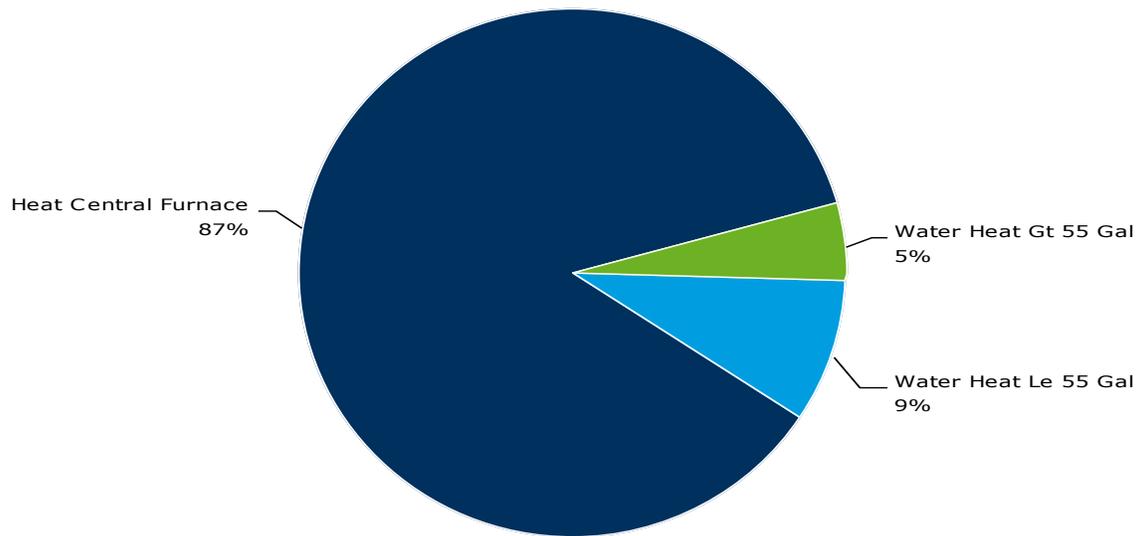


Figure E.24 Gas Achievable Economic Potential: Residential Multifamily by End Use

Total: 1,031,944 Therms

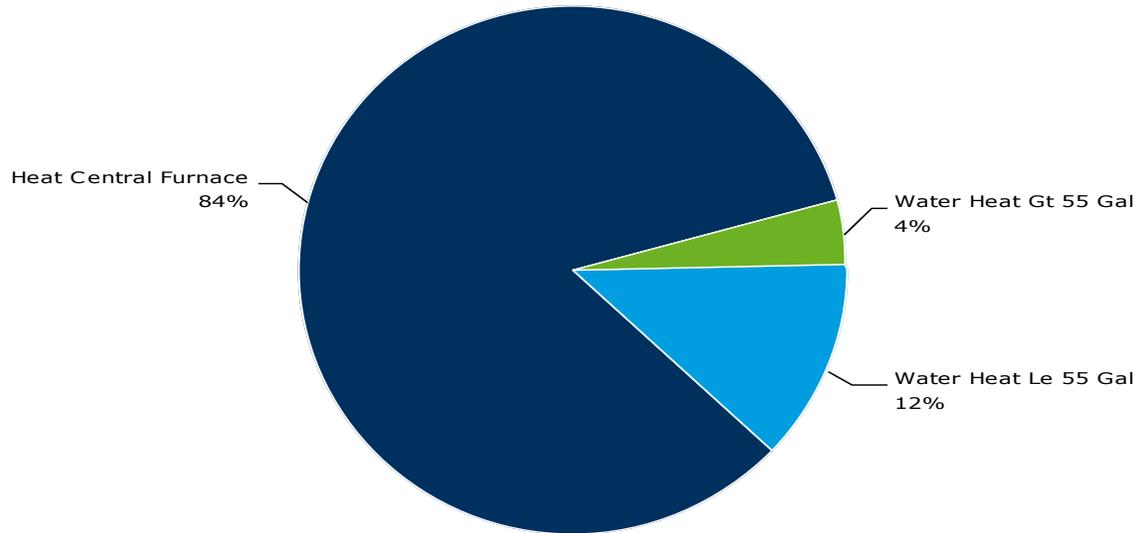
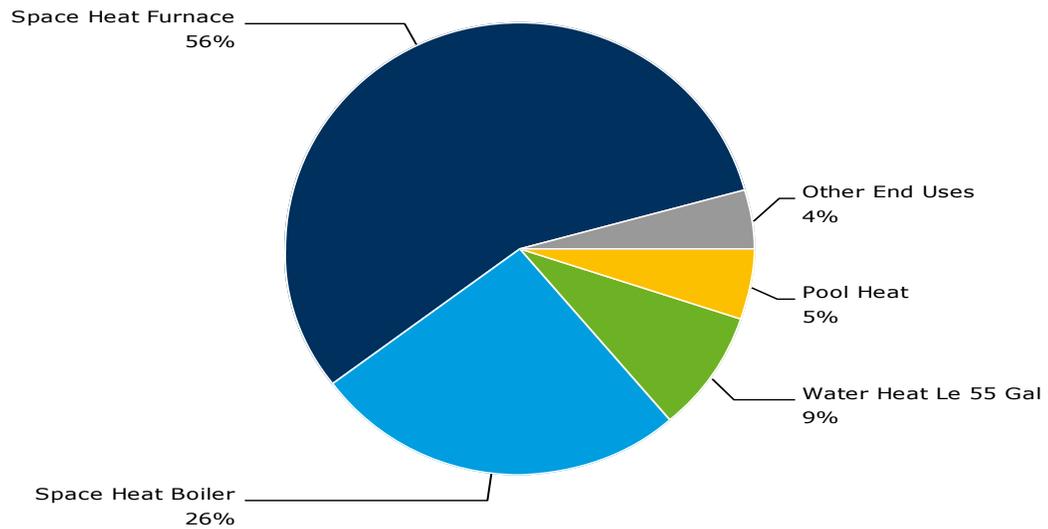


Figure E.26 Gas Achievable Economic Potential: Commercial School by End Use

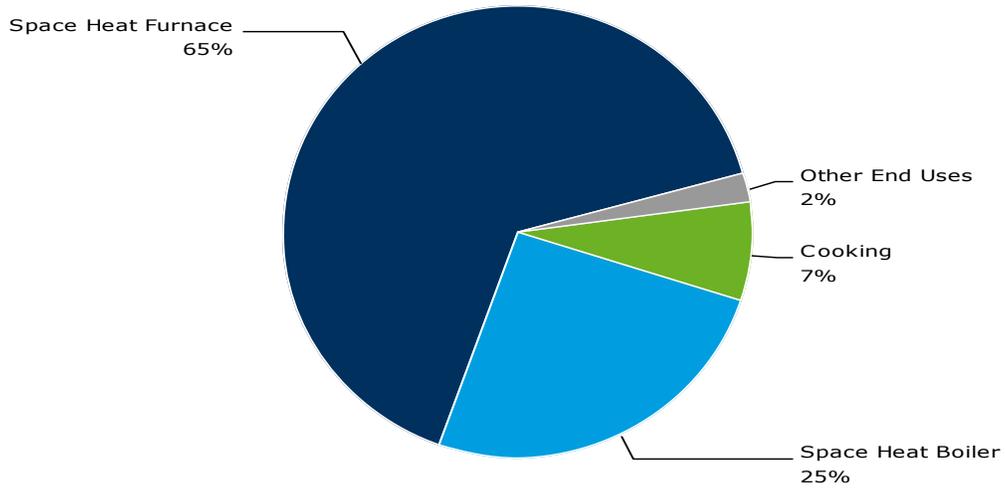
Total: 542,346 Therms



Note: 'Other End Uses' includes:
 Water Heat Gt 55 Gal: 3%, Cooking: <1%

Figure E.27 Gas Achievable Economic Potential: Commercial Grocery by End Use

Total: 13,379 Therms



Note: 'Other End Uses' includes:
 Water Heat Le 55 Gal: 1%, Water Heat Gt 55 Gal: <1%

Figure E.28 Gas Achievable Economic Potential: Commercial Health by End Use

Total: 1,454,869 Therms

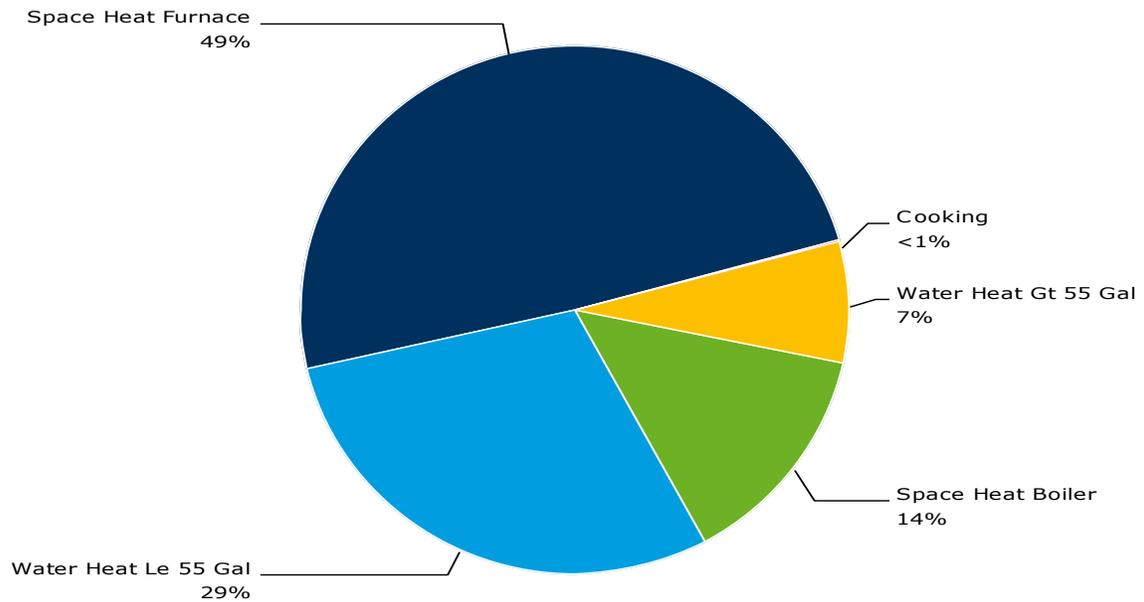


Figure E.29 Gas Achievable Economic Potential: Commercial Lodging by End Use

Total: 860,080 Therms

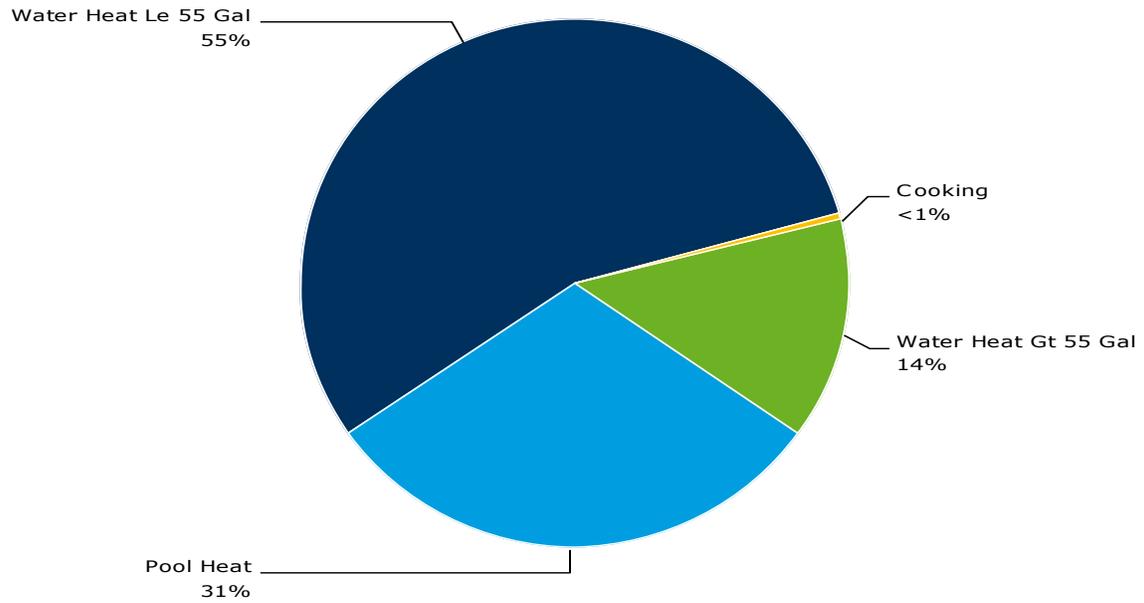
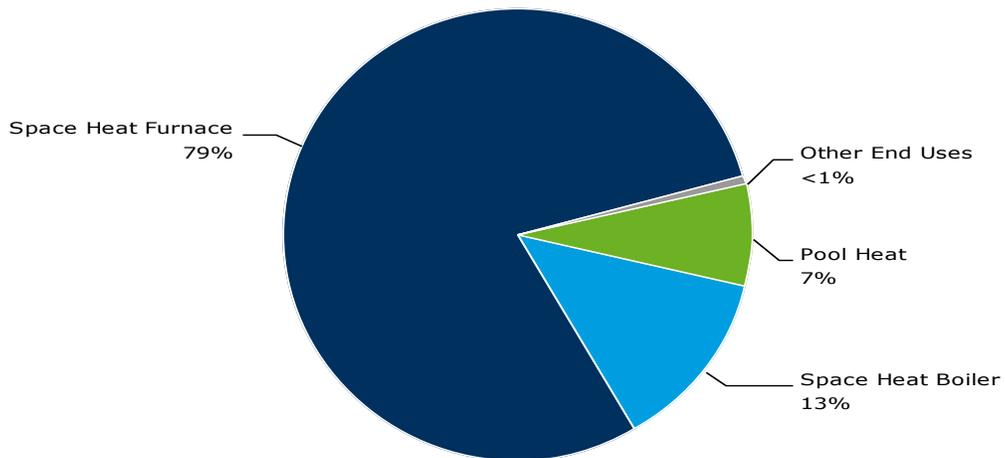


Figure E.30 Gas Achievable Economic Potential: Commercial Miscellaneous by End Use

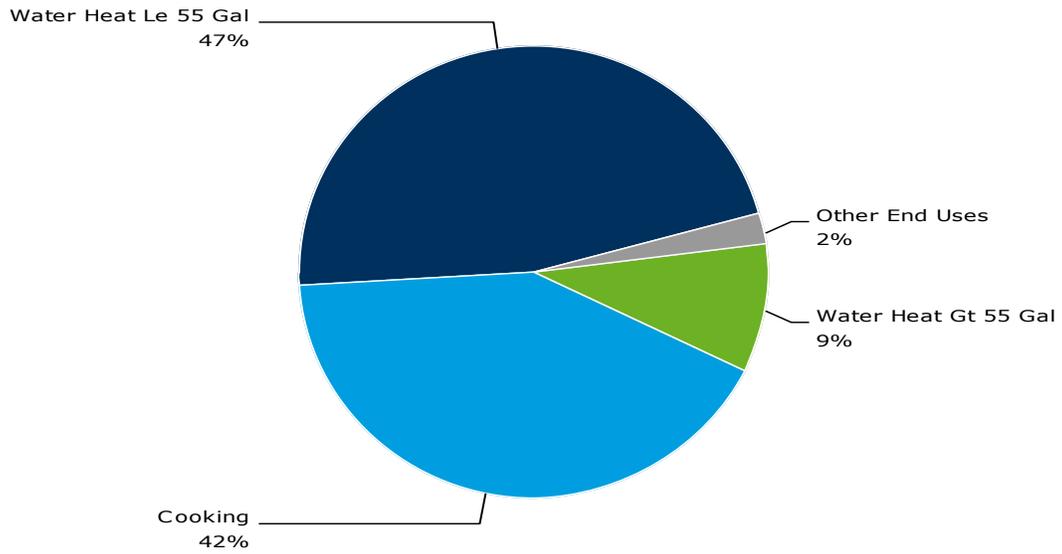
Total: 2,452,027 Therms



Note: 'Other End Uses' includes:
 Water Heat Le 55 Gal: <1%, Water Heat Gt 55 Gal: <1%, Cooking: <1%

Figure E.33 Gas Achievable Economic Potential: Commercial Restaurant by End Use

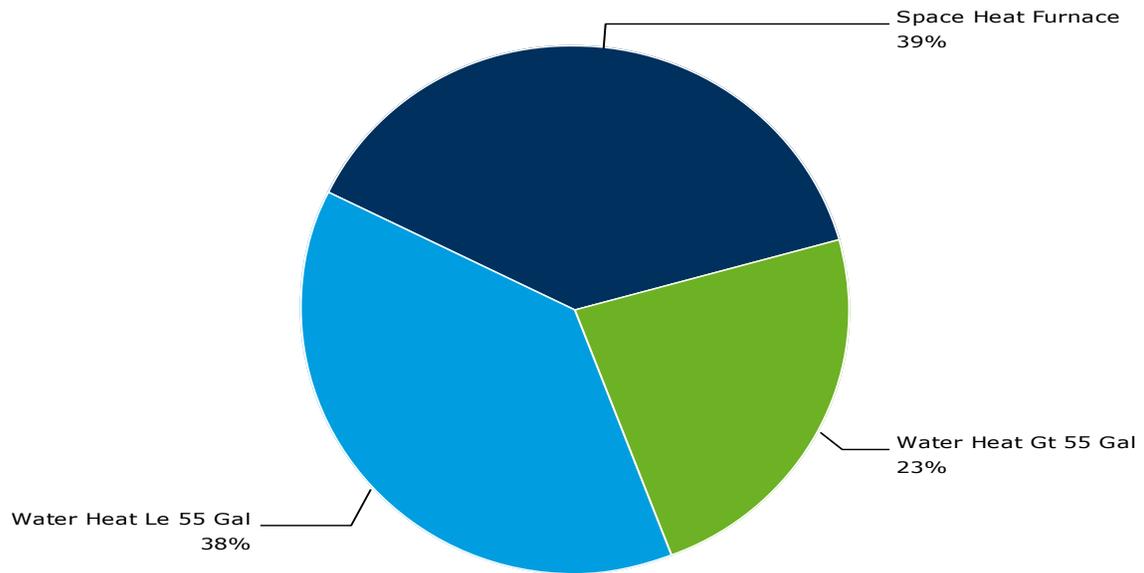
Total: 397,659 Therms



Note: 'Other End Uses' includes:
 Space Heat Furnace: 2%, Space Heat Boiler: <1%

Figure E.36 Gas Achievable Economic Potential: Commercial Warehouse by End Use

Total: 13,301 Therms



Appendix F. Measure Details

Appendix F is a comprehensive list of the energy efficiency measures considered. For each measure, the following are provided:

- **Measure Description:** Technical description of the measure, including measure efficiency.
- **Baseline Description:** Description of measure baseline used to calculate incremental costs and first-year kWh/therm savings.
- **Unit Description:** Units for savings and incremental costs.
- **Construction Vintage:** New or existing construction.
- **Savings Per Unit (kWh or Therm):** First-year kWh or therm savings, without interactions
- **Measure Life:** Expected life of measure.
- **Incremental Cost Per Unit:** Includes incremental equipment, labor, and present value O&M.
- **Percent of Installations Technically Feasible:** The proportion of units (homes, buildings, equipment, etc.) that can receive the measure. Accounts for technical limitations of installing the measure.
- **Percent of Installations Incomplete:** Proportion of units (homes, buildings, equipment, etc.) that have not received the measure.
- **Levelized Cost:** Cost(\$) per kWh or therm saved.
- **2033 Cumulative Achievable Potential:** Represents the cumulative annual energy savings in 2033.

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	Existing	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Manufactured	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	New	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Manufactured	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	Existing	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Manufactured	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	New	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Manufactured	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	208	18	\$1,585	2.5%	95%	\$0.90	0.00
Electric	Manufactured	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	124	40	\$1,502	75%	64%	\$1.07	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	359	15	\$1,160	100%	N/A	\$0.42	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	198	15	\$580	100%	N/A	\$0.38	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	532	15	\$1,934	100%	N/A	\$0.47	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	137	15	\$386	100%	N/A	\$0.37	0.00
Electric	Manufactured	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	1,634	15	\$-1429.6053	0.3%	N/A	\$-0.11	266,833
Electric	Manufactured	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	43	20	\$130	50%	100%	\$0.33	0.00
Electric	Manufactured	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	30	40	\$155	100%	64%	\$0.46	0.00
Electric	Manufactured	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	17	40	\$41	100%	64%	\$0.21	0.00
Electric	Manufactured	Cool Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	387	18	\$1,162	25%	64%	\$0.35	0.00
Electric	Manufactured	Cool Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	72	11	\$33	100%	100%	\$0.07	7,669,606
Electric	Manufactured	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	Existing	218	18	\$262	95%	65%	\$0.14	0.00
Electric	Manufactured	Cool Central	Tune-up - Central Air Conditioner	Central Air Conditioner with Tune-up	Central Air Conditioner with no Tune-up	Savings Per Building	Existing	156	5	\$300	95%	75%	\$0.56	0.00
Electric	Manufactured	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	47	40	\$220	0.0%	95%	\$0.42	0.00
Electric	Manufactured	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	257	40	\$1,245	75%	64%	\$0.43	0.00
Electric	Manufactured	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	312	20	\$455	50%	95%	\$0.16	0.00
Electric	Manufactured	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	72	11	\$172	95%	100%	\$0.38	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	100	25	\$5,374	95%	59%	\$5.43	0.00
Electric	Manufactured	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	122	25	\$9,363	95%	100%	\$7.78	0.00
Electric	Manufactured	Cool Central	Window Film	Window Film	No Film	Savings Per Building	Existing	156	10	\$797	50%	90%	\$0.87	0.00
Electric	Manufactured	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	110	18	\$1,585	20%	95%	\$1.69	0.00
Electric	Manufactured	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	12	40	\$305	95%	64%	\$2.23	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	211	15	\$1,160	100%	N/A	\$0.72	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	116	15	\$580	100%	N/A	\$0.65	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	312	15	\$1,934	100%	N/A	\$0.81	0.00
Electric	Manufactured	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	80	15	\$386	100%	N/A	\$0.63	0.00
Electric	Manufactured	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	842	15	\$-1429.6053	0.3%	N/A	\$-0.22	28,763
Electric	Manufactured	Cool Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	144	40	\$2,465	0.0%	**%	\$1.52	0.00
Electric	Manufactured	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	23	20	\$130	50%	100%	\$0.62	0.00
Electric	Manufactured	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	21	40	\$155	100%	64%	\$0.64	0.00
Electric	Manufactured	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	12	40	\$41	100%	64%	\$0.29	0.00
Electric	Manufactured	Cool Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	55	40	\$19,658	5.0%	**%	\$31.49	0.00
Electric	Manufactured	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	New	116	18	\$262	95%	65%	\$0.27	0.00
Electric	Manufactured	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	32	40	\$212	75%	90%	\$0.58	0.00
Electric	Manufactured	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	166	20	\$455	50%	95%	\$0.31	0.00
Electric	Manufactured	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	38	11	\$172	95%	100%	\$0.71	0.00
Electric	Manufactured	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	18	25	\$1,630	95%	59%	\$8.74	0.00
Electric	Manufactured	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	37	25	\$6,474	95%	100%	\$17.35	0.00
Electric	Manufactured	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	34	40	\$1,502	75%	64%	\$3.85	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$130	50%	100%	\$2.20	0.00
Electric	Manufactured	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	8	40	\$155	100%	64%	\$1.64	0.00
Electric	Manufactured	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	4	40	\$41	100%	64%	\$0.74	0.00
Electric	Manufactured	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	69	15	\$5,691	50%	N/A	\$9.37	0.00
Electric	Manufactured	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Manufactured	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	13	40	\$220	0.0%	95%	\$1.50	0.00
Electric	Manufactured	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	71	40	\$1,245	75%	64%	\$1.55	0.00
Electric	Manufactured	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	11	11	\$172	95%	100%	\$2.49	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	27	25	\$5,374	95%	59%	\$19.56	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	6	25	\$1,342	95%	59%	\$22.47	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	34	25	\$9,363	95%	100%	\$27.99	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	12	25	\$5,331	95%	100%	\$44.63	0.00
Electric	Manufactured	Cool Room	Window Film	Window Film	No Film	Savings Per Building	Existing	23	10	\$797	50%	90%	\$5.75	0.00
Electric	Manufactured	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	4	40	\$305	95%	64%	\$6.25	0.00
Electric	Manufactured	Cool Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	40	40	\$2,465	0.0%	**%	\$5.35	0.00
Electric	Manufactured	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$130	50%	100%	\$2.20	0.00
Electric	Manufactured	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	7	40	\$155	100%	64%	\$1.79	0.00
Electric	Manufactured	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	4	40	\$41	100%	64%	\$0.81	0.00
Electric	Manufactured	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	69	15	\$5,691	95%	N/A	\$10.64	0.00
Electric	Manufactured	Cool Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	15	40	\$19,658	5.0%	**%	\$111.00	0.00
Electric	Manufactured	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Manufactured	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	11	40	\$212	75%	90%	\$1.63	0.00
Electric	Manufactured	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	11	11	\$172	95%	100%	\$2.49	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	6	25	\$1,630	95%	59%	\$24.47	0.00
Electric	Manufactured	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	13	25	\$6,474	95%	100%	\$48.59	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	Existing	125	6	\$1.00	100%	N/A	\$0.00	72,298
Electric	Manufactured	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	New	125	6	\$1.00	100%	N/A	\$0.00	14,889
Electric	Manufactured	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	Existing	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Manufactured	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	New	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Manufactured	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	Existing	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Manufactured	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	New	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Manufactured	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	143	11	\$296	100%	N/A	\$0.33	0.00
Electric	Manufactured	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	131	11	\$267	100%	N/A	\$0.32	0.00
Electric	Manufactured	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	143	11	\$296	100%	N/A	\$0.33	4
Electric	Manufactured	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	131	11	\$267	100%	N/A	\$0.32	-94.646544
Electric	Manufactured	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	46	12	\$6	100%	N/A	\$0.02	0.00
Electric	Manufactured	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Manufactured	Freezer	Freezer - Removal of Stand-Alone	Proper Disposal of Freezer	Existing Non-Efficient Freezer	Savings Per Building	Existing	916	5	\$30	43%	100%	\$0.01	9,377,752
Electric	Manufactured	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	New	46	12	\$6	100%	N/A	\$0.02	0.00
Electric	Manufactured	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	New	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Manufactured	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,122	18	\$1,585	2.5%	95%	\$0.17	0.00
Electric	Manufactured	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,509	40	\$1,502	75%	64%	\$0.09	0.00
Electric	Manufactured	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	366	40	\$155	100%	64%	\$0.04	13,502,416
Electric	Manufactured	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	216	40	\$41	100%	64%	\$0.02	10,845,221
Electric	Manufactured	Heat Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,739	18	\$1,162	25%	64%	\$0.08	0.00
Electric	Manufactured	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,049	40	\$1,071	25%	64%	\$0.05	0.00
Electric	Manufactured	Heat Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	139	11	\$220	75%	70%	\$0.25	0.00
Electric	Manufactured	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	429	40	\$135	0.0%	64%	\$0.03	0.00
Electric	Manufactured	Heat Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	327	11	\$33	100%	100%	\$0.02	25,349,041
Electric	Manufactured	Heat Central	Tune-up - Furnace (Electric)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	982	18	\$262	95%	75%	\$0.03	39,413,036
Electric	Manufactured	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	569	40	\$220	0.0%	95%	\$0.03	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	3,120	40	\$1,245	75%	64%	\$0.04	2,521,449
Electric	Manufactured	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	327	11	\$172	95%	100%	\$0.08	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,221	25	\$5,374	95%	59%	\$0.45	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	265	25	\$1,342	95%	59%	\$0.52	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,486	25	\$9,363	95%	100%	\$0.64	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	530	25	\$5,331	95%	100%	\$1.02	0.00
Electric	Manufactured	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	794	18	\$1,585	20%	95%	\$0.24	0.00
Electric	Manufactured	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	206	40	\$305	95%	64%	\$0.13	0.00
Electric	Manufactured	Heat Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	860	40	\$2,465	0.0%	**	\$0.25	0.00
Electric	Manufactured	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	366	40	\$155	100%	64%	\$0.04	1,959,280
Electric	Manufactured	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	216	40	\$41	100%	64%	\$0.02	1,253,912
Electric	Manufactured	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	121	40	\$296	75%	64%	\$0.22	0.00
Electric	Manufactured	Heat Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	330	40	\$19,658	5.0%	**	\$5.27	0.00
Electric	Manufactured	Heat Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	517	20	\$569	0.0%	95%	\$0.12	0.00
Electric	Manufactured	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	906	40	\$501	20%	75%	\$0.05	0.00
Electric	Manufactured	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	549	40	\$212	75%	90%	\$0.03	3,298,163
Electric	Manufactured	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	231	11	\$172	95%	100%	\$0.12	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	322	25	\$1,630	95%	59%	\$0.52	0.00
Electric	Manufactured	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	644	25	\$6,474	95%	100%	\$1.02	0.00
Electric	Manufactured	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,026	18	\$1,585	2.5%	95%	\$0.18	0.00
Electric	Manufactured	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	840	40	\$1,502	75%	64%	\$0.16	0.00
Electric	Manufactured	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	53	20	\$130	50%	100%	\$0.27	0.00
Electric	Manufactured	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	203	40	\$155	100%	64%	\$0.07	5,134,644
Electric	Manufactured	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	120	40	\$41	100%	64%	\$0.03	3,644,898
Electric	Manufactured	Heat Pump	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,674	18	\$1,162	25%	64%	\$0.08	10,388,134
Electric	Manufactured	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	971	40	\$1,071	25%	64%	\$0.10	5,847,280
Electric	Manufactured	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	902	15	\$1,011	100%	N/A	\$0.15	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	617	15	\$758	100%	N/A	\$0.16	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,835	15	\$2,527	100%	N/A	\$0.18	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	556	15	\$505	100%	N/A	\$0.12	-13837.036704
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,352	15	\$1,516	100%	N/A	\$0.15	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	3,251	15	\$6,441	25%	N/A	\$0.26	0.00
Electric	Manufactured	Heat Pump	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	72	11	\$220	75%	70%	\$0.48	0.00
Electric	Manufactured	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	203	40	\$135	0.0%	64%	\$0.06	0.00
Electric	Manufactured	Heat Pump	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	315	11	\$33	100%	100%	\$0.02	15,504,202
Electric	Manufactured	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	1,036	15	\$412	95%	65%	\$0.05	23,101,373
Electric	Manufactured	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	309	5	\$300	20%	75%	\$0.28	0.00
Electric	Manufactured	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	317	40	\$220	0.0%	95%	\$0.06	0.00
Electric	Manufactured	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,736	40	\$1,245	75%	64%	\$0.06	36,101,137
Electric	Manufactured	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	270	20	\$455	50%	95%	\$0.19	0.00
Electric	Manufactured	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	315	11	\$172	95%	100%	\$0.09	0.00
Electric	Manufactured	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	679	25	\$5,374	95%	59%	\$0.81	0.00
Electric	Manufactured	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	147	25	\$1,342	95%	59%	\$0.93	0.00
Electric	Manufactured	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	827	25	\$9,363	95%	100%	\$1.15	0.00
Electric	Manufactured	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	295	25	\$5,331	95%	100%	\$1.84	0.00
Electric	Manufactured	Heat Pump	Window Film	Window Film	No Film	Savings Per Building	Existing	675	10	\$797	50%	90%	\$0.20	0.00
Electric	Manufactured	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	774	18	\$1,585	20%	95%	\$0.24	0.00
Electric	Manufactured	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	97	40	\$305	95%	64%	\$0.28	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Heat Pump	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	883	40	\$2,465	0.0%	**%	\$0.25	0.00
Electric	Manufactured	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	40	20	\$130	50%	100%	\$0.36	0.00
Electric	Manufactured	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	174	40	\$155	100%	64%	\$0.08	589,525
Electric	Manufactured	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	103	40	\$41	100%	64%	\$0.04	389,655
Electric	Manufactured	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	50	40	\$296	75%	64%	\$0.52	0.00
Electric	Manufactured	Heat Pump	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	339	40	\$19,658	5.0%	**%	\$5.14	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	694	15	\$1,011	100%	N/A	\$0.19	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	469	15	\$758	100%	N/A	\$0.21	5
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,408	15	\$2,527	100%	N/A	\$0.23	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	433	15	\$505	100%	N/A	\$0.15	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,046	15	\$1,516	100%	N/A	\$0.19	0.00
Electric	Manufactured	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	2,560	15	\$6,543	50%	N/A	\$0.33	0.00
Electric	Manufactured	Heat Pump	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	406	20	\$569	0.0%	95%	\$0.16	0.00
Electric	Manufactured	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	787	15	\$412	95%	65%	\$0.07	2,435,266
Electric	Manufactured	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	377	40	\$501	20%	75%	\$0.12	286,255
Electric	Manufactured	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	260	40	\$212	75%	90%	\$0.07	961,731
Electric	Manufactured	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	203	20	\$455	50%	95%	\$0.25	0.00
Electric	Manufactured	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	237	11	\$172	95%	100%	\$0.12	1,152,305
Electric	Manufactured	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	153	25	\$1,630	95%	59%	\$1.08	0.00
Electric	Manufactured	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	306	25	\$6,474	95%	100%	\$2.15	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	377	40	\$1,502	75%	64%	\$0.35	0.00
Electric	Manufactured	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	91	40	\$155	100%	64%	\$0.15	0.00
Electric	Manufactured	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	54	40	\$41	100%	64%	\$0.07	0.00
Electric	Manufactured	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	4,745	15	\$4,525	50%	N/A	\$0.12	0.00
Electric	Manufactured	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,049	40	\$1,071	25%	64%	\$0.05	0.00
Electric	Manufactured	Heat Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	106	11	\$220	75%	70%	\$0.33	0.00
Electric	Manufactured	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	429	40	\$135	0.0%	64%	\$0.03	0.00
Electric	Manufactured	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	142	40	\$220	0.0%	95%	\$0.14	0.00
Electric	Manufactured	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	780	40	\$1,245	75%	64%	\$0.14	0.00
Electric	Manufactured	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	248	11	\$172	95%	100%	\$0.11	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	305	25	\$5,374	95%	59%	\$1.79	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	66	25	\$1,342	95%	59%	\$2.06	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	371	25	\$9,363	95%	100%	\$2.57	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	132	25	\$5,331	95%	100%	\$4.09	0.00
Electric	Manufactured	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	51	40	\$305	95%	64%	\$0.53	0.00
Electric	Manufactured	Heat Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	653	40	\$2,465	0.0%	**%	\$0.33	0.00
Electric	Manufactured	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	91	40	\$155	100%	64%	\$0.15	0.00
Electric	Manufactured	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	54	40	\$41	100%	64%	\$0.07	0.00
Electric	Manufactured	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	New	3,358	15	\$4,525	95%	N/A	\$0.18	0.00
Electric	Manufactured	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	121	40	\$296	75%	64%	\$0.22	0.00
Electric	Manufactured	Heat Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	251	40	\$19,658	5.0%	**%	\$6.94	0.00
Electric	Manufactured	Heat Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	399	20	\$569	0.0%	95%	\$0.16	0.00
Electric	Manufactured	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	906	40	\$501	20%	75%	\$0.05	0.00
Electric	Manufactured	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	137	40	\$212	75%	90%	\$0.14	0.00
Electric	Manufactured	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	176	11	\$172	95%	100%	\$0.16	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	80	25	\$1,630	95%	59%	\$2.06	0.00
Electric	Manufactured	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	161	25	\$6,474	95%	100%	\$4.09	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	Existing	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Manufactured	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	New	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Manufactured	Lighting Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	7	\$1	50%	N/A	\$-0.04	10,260,688
Electric	Manufactured	Lighting Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Manufactured	Lighting Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	25	7	\$1	50%	N/A	\$-0.04	1,556,015
Electric	Manufactured	Lighting Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	11	2	\$0.91	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	34	12	\$21	100%	N/A	\$0.08	0.00
Electric	Manufactured	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	Existing	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Manufactured	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	Existing	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Manufactured	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	Existing	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	11	2	\$0.91	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Manufactured	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	34	12	\$21	100%	N/A	\$0.08	0.00
Electric	Manufactured	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	New	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Manufactured	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	New	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Manufactured	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	New	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Manufactured	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	Existing	14	5	\$1.00	100%	N/A	\$0.02	140,973
Electric	Manufactured	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	New	14	5	\$1.00	100%	N/A	\$0.02	34,665

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	Existing	149	6	\$1.00	100%	N/A	\$0.00	1,368,058
Electric	Manufactured	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	New	149	6	\$1.00	100%	N/A	\$0.00	0.00
Electric	Manufactured	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	Existing	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Manufactured	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	New	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Manufactured	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	Existing	91	5	\$1.00	100%	N/A	\$0.00	0.00
Electric	Manufactured	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	New	91	5	\$1.00	100%	N/A	\$0.00	0.00
Electric	Manufactured	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	139	10	\$472	100%	N/A	\$0.57	0.00
Electric	Manufactured	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	167	10	\$633	100%	N/A	\$0.64	0.00
Electric	Manufactured	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	111	12	\$37	100%	N/A	\$0.05	3,922,433
Electric	Manufactured	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Manufactured	Refrigerator	Refrigerator - Removal of Secondary	Proper Disposal of Refrigerator	Existing Non-Efficient Refrigerator	Savings Per Building	Existing	1,140	5	\$30	9.5%	100%	\$0.01	6,814,861
Electric	Manufactured	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	139	12	\$472	100%	N/A	\$0.51	0.00
Electric	Manufactured	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	167	12	\$633	100%	N/A	\$0.57	0.00
Electric	Manufactured	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	111	12	\$37	100%	N/A	\$0.05	657,395
Electric	Manufactured	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Manufactured	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	Existing	201	5	\$6	100%	N/A	\$0.01	7,107,487
Electric	Manufactured	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	New	201	5	\$6	100%	N/A	\$0.01	703,723
Electric	Manufactured	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	Existing	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Manufactured	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	New	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Manufactured	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	207	20	\$120	100%	N/A	\$0.06	0.00
Electric	Manufactured	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	207	20	\$120	100%	N/A	\$0.06	0.00
Electric	Manufactured	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	2,137	13	\$1,684	50%	N/A	\$0.12	0.00
Electric	Manufactured	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	51	13	\$1,003	50%	N/A	\$3.29	0.00
Electric	Manufactured	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,117	20	\$5,517	20%	N/A	\$0.31	0.00
Electric	Manufactured	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	2,137	13	\$1,684	50%	N/A	\$0.12	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 1.97	Per Installation	New	51	13	\$1,003	50%	N/A	\$3.29	0.00
Electric	Manufactured	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,117	20	\$5,517	20%	N/A	\$0.31	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	211	11	\$140	98%	82%	\$0.11	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	75	11	\$58	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	369	11	\$210	98%	82%	\$0.09	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	274	11	\$198	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	139	11	\$116	98%	82%	\$0.13	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	432	11	\$268	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	293	11	\$152	98%	82%	\$0.08	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	157	11	\$70	98%	82%	\$0.07	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	50	11	\$161	52%	62%	\$0.51	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	10	11	\$7	52%	62%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	88	11	\$309	52%	62%	\$0.56	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	47	11	\$155	52%	62%	\$0.52	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	40	11	\$154	52%	62%	\$0.61	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	415	40	\$935	30%	**%	\$0.20	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	121	10	\$5	100%	25%	\$0.01	551,486
Electric	Manufactured	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	106	10	\$1	66%	65%	\$0.00	828,056
Electric	Manufactured	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	258	10	\$8	66%	95%	\$0.01	2,939,146
Electric	Manufactured	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	322	10	\$12	100%	65%	\$0.01	3,792,025
Electric	Manufactured	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	322	10	\$37	100%	10%	\$0.02	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	90%	30%	\$0.01	223,416
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	211	11	\$140	98%	82%	\$0.11	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	75	11	\$58	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	369	11	\$210	98%	82%	\$0.09	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	274	11	\$198	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	139	11	\$116	98%	82%	\$0.13	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	432	11	\$268	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	293	11	\$152	98%	82%	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	157	11	\$70	98%	82%	\$0.07	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	50	11	\$161	52%	62%	\$0.51	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	10	11	\$7	52%	62%	\$0.12	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	88	11	\$309	52%	62%	\$0.56	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	47	11	\$155	52%	62%	\$0.52	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	40	11	\$154	52%	62%	\$0.61	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	413	40	\$935	60%	***	\$0.20	0.00
Electric	Manufactured	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	106	10	\$1	66%	65%	\$0.00	116,877
Electric	Manufactured	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	258	10	\$8	66%	95%	\$0.01	414,849
Electric	Manufactured	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	322	10	\$12	100%	65%	\$0.01	535,230
Electric	Manufactured	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,812	13	\$1,123	50%	N/A	\$0.10	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,117	20	\$5,517	20%	N/A	\$0.31	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	107	13	\$72	100%	N/A	\$0.10	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,812	13	\$1,123	50%	N/A	\$0.10	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,117	20	\$5,517	20%	N/A	\$0.31	0.00
Electric	Manufactured	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	107	13	\$72	100%	N/A	\$0.10	-230.907468

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	211	11	\$140	98%	82%	\$0.11	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	75	11	\$58	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	369	11	\$210	98%	82%	\$0.09	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	274	11	\$198	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	139	11	\$116	98%	82%	\$0.13	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	432	11	\$268	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	293	11	\$152	98%	82%	\$0.08	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	157	11	\$70	98%	82%	\$0.07	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	50	11	\$161	52%	62%	\$0.51	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	10	11	\$7	52%	62%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	88	11	\$309	52%	62%	\$0.56	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	47	11	\$155	52%	62%	\$0.52	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	40	11	\$154	52%	62%	\$0.61	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	415	40	\$935	30%	**%	\$0.20	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	121	10	\$5	100%	25%	\$0.01	3,525,160
Electric	Manufactured	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	106	10	\$1	66%	65%	\$0.00	5,293,027
Electric	Manufactured	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	258	10	\$8	66%	95%	\$0.01	18,787,341
Electric	Manufactured	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	322	10	\$12	100%	65%	\$0.01	24,239,034
Electric	Manufactured	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	322	10	\$37	100%	10%	\$0.02	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	90%	30%	\$0.01	1,428,101
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	211	11	\$140	98%	82%	\$0.11	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	75	11	\$58	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	369	11	\$210	98%	82%	\$0.09	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	274	11	\$198	98%	82%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	139	11	\$116	98%	82%	\$0.13	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	432	11	\$268	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	135	11	\$81	98%	82%	\$0.10	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	293	11	\$152	98%	82%	\$0.08	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	157	11	\$70	98%	82%	\$0.07	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	135	11	\$81	98%	82%	\$0.10	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	50	11	\$161	52%	62%	\$0.51	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	10	11	\$7	52%	62%	\$0.12	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	88	11	\$309	52%	62%	\$0.56	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	47	11	\$155	52%	62%	\$0.52	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	40	11	\$154	52%	62%	\$0.61	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	397	40	\$935	60%	**%	\$0.21	0.00
Electric	Manufactured	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	106	10	\$1	66%	65%	\$0.00	735,423
Electric	Manufactured	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	258	10	\$8	66%	95%	\$0.01	2,610,348
Electric	Manufactured	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	322	10	\$12	100%	65%	\$0.01	3,367,816
Electric	Manufactured	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Multifamily	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	Existing	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Multifamily	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	New	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Multifamily	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	Existing	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Multifamily	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	New	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Multifamily	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	141	18	\$1,585	2.5%	95%	\$1.32	0.00
Electric	Multifamily	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	172	18	\$1,585	2.5%	95%	\$1.08	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	99	40	\$1,200	25%	62%	\$1.07	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	99	40	\$1,200	25%	62%	\$1.07	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	108	40	\$1,074	25%	62%	\$0.88	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	108	40	\$1,074	25%	62%	\$0.88	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	244	15	\$928	100%	N/A	\$0.50	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	244	15	\$928	100%	N/A	\$0.50	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	298	15	\$928	100%	N/A	\$0.41	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	298	15	\$928	100%	N/A	\$0.41	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	134	15	\$464	100%	N/A	\$0.45	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	164	15	\$464	100%	N/A	\$0.37	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	362	15	\$1,547	100%	N/A	\$0.56	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	442	15	\$1,547	100%	N/A	\$0.46	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	93	15	\$309	100%	N/A	\$0.43	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	113	15	\$309	100%	N/A	\$0.36	0.00
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	1,077	15	-\$1143.6842	0.3%	N/A	-\$0.14	425,717
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	1,077	15	-\$1143.6842	0.3%	N/A	-\$0.14	425,717
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	1,365	15	-\$1143.6842	0.3%	N/A	-\$0.11	656,774
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	1,365	15	-\$1143.6842	0.3%	N/A	-\$0.11	656,774
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	27	20	\$97	50%	100%	\$0.40	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	27	20	\$97	50%	100%	\$0.40	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	29	20	\$107	50%	100%	\$0.40	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	29	20	\$107	50%	100%	\$0.40	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	18	40	\$97	100%	62%	\$0.46	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	23	40	\$97	100%	62%	\$0.37	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	11	40	\$26	100%	62%	\$0.21	1,725,998
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	11	40	\$26	100%	62%	\$0.21	1,725,998
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	13	40	\$26	100%	62%	\$0.17	2,532,358
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	13	40	\$26	100%	62%	\$0.17	2,532,358
Electric	Multifamily	Cool Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	263	18	\$1,162	25%	62%	\$0.52	0.00
Electric	Multifamily	Cool Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	321	18	\$1,162	25%	62%	\$0.43	0.00
Electric	Multifamily	Cool Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	13	11	\$222	75%	92%	\$2.62	0.00
Electric	Multifamily	Cool Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	16	11	\$191	75%	92%	\$1.86	0.00
Electric	Multifamily	Cool Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	49	11	\$33	100%	94%	\$0.11	11,899,904
Electric	Multifamily	Cool Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	60	11	\$33	100%	94%	\$0.09	17,459,360
Electric	Multifamily	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	Existing	148	18	\$262	95%	65%	\$0.21	0.00
Electric	Multifamily	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	Existing	181	18	\$262	95%	65%	\$0.17	0.00
Electric	Multifamily	Cool Central	Tune-up - Central Air Conditioner	Central Air Conditioner with Tune-up	Central Air Conditioner with no Tune-up	Savings Per Building	Existing	106	5	\$300	95%	75%	\$0.82	0.00
Electric	Multifamily	Cool Central	Tune-up - Central Air Conditioner	Central Air Conditioner with Tune-up	Central Air Conditioner with no Tune-up	Savings Per Building	Existing	129	5	\$300	95%	75%	\$0.68	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	25	40	\$117	0.0%	95%	\$0.42	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	25	40	\$117	0.0%	95%	\$0.42	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	28	40	\$108	0.0%	95%	\$0.34	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	28	40	\$108	0.0%	95%	\$0.34	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	137	40	\$665	50%	62%	\$0.43	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	137	40	\$665	50%	62%	\$0.43	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	154	40	\$611	50%	62%	\$0.35	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	154	40	\$611	50%	62%	\$0.35	0.00
Electric	Multifamily	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	212	20	\$455	10%	95%	\$0.24	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	259	20	\$455	10%	95%	\$0.20	0.00
Electric	Multifamily	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	49	11	\$172	10%	100%	\$0.55	0.00
Electric	Multifamily	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	60	11	\$172	10%	100%	\$0.45	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	72	25	\$3,866	95%	50%	\$5.43	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	72	25	\$3,866	95%	50%	\$5.43	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	76	25	\$3,341	95%	50%	\$4.45	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	76	25	\$3,341	95%	50%	\$4.45	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	88	25	\$6,737	95%	100%	\$7.78	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	88	25	\$6,737	95%	100%	\$7.78	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	93	25	\$5,820	95%	100%	\$6.37	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	93	25	\$5,820	95%	100%	\$6.37	0.00
Electric	Multifamily	Cool Central	Window Film	Window Film	No Film	Savings Per Building	Existing	106	10	\$574	25%	90%	\$0.92	0.00
Electric	Multifamily	Cool Central	Window Film	Window Film	No Film	Savings Per Building	Existing	129	10	\$495	25%	90%	\$0.65	0.00
Electric	Multifamily	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	87	18	\$1,585	20%	95%	\$2.13	0.00
Electric	Multifamily	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	107	18	\$1,585	20%	95%	\$1.75	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	9	40	\$244	75%	62%	\$2.23	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	9	40	\$244	75%	62%	\$2.23	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	10	40	\$218	75%	62%	\$1.83	0.00
Electric	Multifamily	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	10	40	\$218	75%	62%	\$1.83	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	167	15	\$928	100%	N/A	\$0.73	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	204	15	\$928	100%	N/A	\$0.59	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	92	15	\$464	100%	N/A	\$0.66	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	112	15	\$464	100%	N/A	\$0.54	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	247	15	\$1,547	100%	N/A	\$0.82	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	302	15	\$1,547	100%	N/A	\$0.67	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	63	15	\$309	100%	N/A	\$0.63	0.00
Electric	Multifamily	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	77	15	\$309	100%	N/A	\$0.52	0.00
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	665	15	-\$1143.6842	0.3%	N/A	-\$0.22	55,255
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	665	15	-\$1143.6842	0.3%	N/A	-\$0.22	55,255
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	862	15	-\$1143.6842	0.3%	N/A	-\$0.17	90,777
Electric	Multifamily	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	862	15	-\$1143.6842	0.3%	N/A	-\$0.17	90,777
Electric	Multifamily	Cool Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	114	40	\$2,483	5.0%	**%	\$1.93	0.00
Electric	Multifamily	Cool Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	139	40	\$2,145	5.0%	**%	\$1.37	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	16	20	\$97	50%	100%	\$0.64	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	16	20	\$97	50%	100%	\$0.64	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	18	20	\$107	50%	100%	\$0.65	0.00
Electric	Multifamily	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	18	20	\$107	50%	100%	\$0.65	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	13	40	\$97	100%	62%	\$0.64	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	13	40	\$97	100%	62%	\$0.64	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	16	40	\$97	100%	62%	\$0.52	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	16	40	\$97	100%	62%	\$0.52	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	7	40	\$26	100%	62%	\$0.29	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	7	40	\$26	100%	62%	\$0.29	0.00
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	9	40	\$26	100%	62%	\$0.24	245,844
Electric	Multifamily	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	9	40	\$26	100%	62%	\$0.24	245,844

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	43	40	\$16,235	10%	**%	\$32.82	0.00
Electric	Multifamily	Cool Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	53	40	\$14,737	10%	**%	\$24.40	0.00
Electric	Multifamily	Cool Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	12	20	\$574	0.0%	95%	\$5.00	0.00
Electric	Multifamily	Cool Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	15	20	\$495	0.0%	95%	\$3.54	0.00
Electric	Multifamily	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	New	92	18	\$262	95%	65%	\$0.34	0.00
Electric	Multifamily	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	New	112	18	\$262	95%	65%	\$0.28	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	16	40	\$110	75%	90%	\$0.58	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	16	40	\$110	75%	90%	\$0.58	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	19	40	\$102	75%	90%	\$0.48	0.00
Electric	Multifamily	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	19	40	\$102	75%	90%	\$0.48	0.00
Electric	Multifamily	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	131	20	\$455	10%	95%	\$0.39	0.00
Electric	Multifamily	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	160	20	\$455	10%	95%	\$0.32	0.00
Electric	Multifamily	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	30	11	\$172	10%	100%	\$0.89	0.00
Electric	Multifamily	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	37	11	\$172	10%	100%	\$0.73	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	14	25	\$1,207	95%	50%	\$8.74	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	14	25	\$1,207	95%	50%	\$8.74	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	14	25	\$1,043	95%	50%	\$7.16	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	14	25	\$1,043	95%	50%	\$7.16	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	28	25	\$4,795	95%	100%	\$17.35	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	28	25	\$4,795	95%	100%	\$17.35	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	29	25	\$4,143	95%	100%	\$14.22	0.00
Electric	Multifamily	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	29	25	\$4,143	95%	100%	\$14.22	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	27	40	\$1,200	25%	62%	\$3.85	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	27	40	\$1,200	25%	62%	\$3.85	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	30	40	\$1,074	25%	62%	\$3.16	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	30	40	\$1,074	25%	62%	\$3.16	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$97	50%	100%	\$1.80	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$97	50%	100%	\$1.80	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$107	50%	100%	\$1.82	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$107	50%	100%	\$1.82	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	5	40	\$97	100%	62%	\$1.64	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	5	40	\$97	100%	62%	\$1.64	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	6	40	\$97	100%	62%	\$1.35	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	6	40	\$97	100%	62%	\$1.35	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	3	40	\$26	100%	62%	\$0.74	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	3	40	\$26	100%	62%	\$0.74	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	3	40	\$26	100%	62%	\$0.61	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	3	40	\$26	100%	62%	\$0.61	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	69	15	\$5,732	25%	N/A	\$9.44	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	69	15	\$5,732	50%	N/A	\$9.44	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	85	15	\$4,953	25%	N/A	\$6.68	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	85	15	\$4,953	50%	N/A	\$6.68	0.00
Electric	Multifamily	Cool Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	2	11	\$222	75%	92%	\$11.82	0.00
Electric	Multifamily	Cool Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	3	11	\$191	75%	92%	\$8.36	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	36	9	\$41	100%	N/A	\$0.21	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	6	40	\$117	0.0%	95%	\$1.50	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	6	40	\$117	0.0%	95%	\$1.50	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	7	40	\$108	0.0%	95%	\$1.23	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	7	40	\$108	0.0%	95%	\$1.23	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	38	40	\$665	50%	62%	\$1.55	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	38	40	\$665	50%	62%	\$1.55	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	42	40	\$611	50%	62%	\$1.27	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	42	40	\$611	50%	62%	\$1.27	0.00
Electric	Multifamily	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	11	11	\$172	10%	100%	\$2.49	0.00
Electric	Multifamily	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	13	11	\$172	10%	100%	\$2.04	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	20	25	\$3,866	95%	50%	\$19.56	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	20	25	\$3,866	95%	50%	\$19.56	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	21	25	\$3,341	95%	50%	\$16.02	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	21	25	\$3,341	95%	50%	\$16.02	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	4	25	\$965	95%	50%	\$22.47	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	4	25	\$965	95%	50%	\$22.47	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	4	25	\$834	95%	50%	\$18.41	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	4	25	\$834	95%	50%	\$18.41	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	24	25	\$6,737	95%	100%	\$27.99	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	24	25	\$6,737	95%	100%	\$27.99	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	25	25	\$5,820	95%	100%	\$22.93	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	25	25	\$5,820	95%	100%	\$22.93	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	8	25	\$3,836	95%	100%	\$44.63	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	8	25	\$3,836	95%	100%	\$44.63	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	9	25	\$3,314	95%	100%	\$36.56	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	9	25	\$3,314	95%	100%	\$36.56	0.00
Electric	Multifamily	Cool Room	Window Film	Window Film	No Film	Savings Per Building	Existing	23	10	\$574	25%	90%	\$4.14	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Room	Window Film	Window Film	No Film	Savings Per Building	Existing	28	10	\$495	25%	90%	\$2.93	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	3	40	\$244	75%	62%	\$6.25	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	3	40	\$244	75%	62%	\$6.25	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	3	40	\$218	75%	62%	\$5.12	0.00
Electric	Multifamily	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	3	40	\$218	75%	62%	\$5.12	0.00
Electric	Multifamily	Cool Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	40	40	\$2,483	5.0%	**%	\$5.39	0.00
Electric	Multifamily	Cool Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	49	40	\$2,145	5.0%	**%	\$3.82	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$97	50%	100%	\$1.80	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$97	50%	100%	\$1.80	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$107	50%	100%	\$1.82	0.00
Electric	Multifamily	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$107	50%	100%	\$1.82	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	4	40	\$97	100%	62%	\$1.79	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	4	40	\$97	100%	62%	\$1.79	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	5	40	\$97	100%	62%	\$1.47	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	5	40	\$97	100%	62%	\$1.47	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	2	40	\$26	100%	62%	\$0.81	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	2	40	\$26	100%	62%	\$0.81	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	3	40	\$26	100%	62%	\$0.66	0.00
Electric	Multifamily	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	3	40	\$26	100%	62%	\$0.66	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	69	15	\$5,732	95%	N/A	\$10.72	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	69	15	\$5,732	95%	N/A	\$10.72	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	85	15	\$4,953	95%	N/A	\$7.59	0.00
Electric	Multifamily	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	85	15	\$4,953	95%	N/A	\$7.59	0.00
Electric	Multifamily	Cool Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	15	40	\$16,235	10%	**%	\$91.67	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Cool Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	19	40	\$14,737	10%	***	\$68.16	0.00
Electric	Multifamily	Cool Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	4	20	\$574	0.0%	95%	\$13.97	0.00
Electric	Multifamily	Cool Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	5	20	\$495	0.0%	95%	\$9.89	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Multifamily	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	6	40	\$110	75%	90%	\$1.63	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	6	40	\$110	75%	90%	\$1.63	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	6	40	\$102	75%	90%	\$1.33	0.00
Electric	Multifamily	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	6	40	\$102	75%	90%	\$1.33	0.00
Electric	Multifamily	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	11	11	\$172	10%	100%	\$2.49	0.00
Electric	Multifamily	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	13	11	\$172	10%	100%	\$2.04	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	5	25	\$1,207	95%	50%	\$24.47	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	5	25	\$1,207	95%	50%	\$24.47	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	5	25	\$1,043	95%	50%	\$20.05	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	5	25	\$1,043	95%	50%	\$20.05	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	10	25	\$4,795	95%	100%	\$48.59	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	10	25	\$4,795	95%	100%	\$48.59	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	10	25	\$4,143	95%	100%	\$39.81	0.00
Electric	Multifamily	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	10	25	\$4,143	95%	100%	\$39.81	0.00
Electric	Multifamily	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	Existing	125	6	\$1.00	100%	N/A	\$0.00	49,869
Electric	Multifamily	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	Existing	125	6	\$1.00	100%	N/A	\$0.00	56,719

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	New	125	6	\$1.00	100%	N/A	\$0.00	10,270
Electric	Multifamily	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	New	125	6	\$1.00	100%	N/A	\$0.00	12,372
Electric	Multifamily	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	Existing	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Multifamily	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	New	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Multifamily	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	Existing	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Multifamily	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	New	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	109	11	\$296	100%	N/A	\$0.43	0.00
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	109	11	\$296	100%	N/A	\$0.43	0.00
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	126	11	\$296	100%	N/A	\$0.37	0.00
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	126	11	\$296	100%	N/A	\$0.37	0.00
Electric	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	101	11	\$267	100%	N/A	\$0.42	0.00
Electric	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	116	11	\$267	100%	N/A	\$0.37	0.00
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	109	11	\$296	100%	N/A	\$0.43	4
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	109	11	\$296	100%	N/A	\$0.43	4
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	126	11	\$296	100%	N/A	\$0.37	0.80
Electric	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	126	11	\$296	100%	N/A	\$0.37	0.80
Electric	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	101	11	\$267	100%	N/A	\$0.42	-100.422888
Electric	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	116	11	\$267	100%	N/A	\$0.37	-137.5758
Electric	Multifamily	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	46	12	\$6	100%	N/A	\$0.02	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Multifamily	Freezer	Freezer - Removal of Stand-Alone	Proper Disposal of Freezer	Existing Non-Efficient Freezer	Savings Per Building	Existing	916	5	\$30	19%	100%	\$0.01	3,709,044
Electric	Multifamily	Freezer	Freezer - Removal of Stand-Alone	Proper Disposal of Freezer	Existing Non-Efficient Freezer	Savings Per Building	Existing	916	5	\$30	19%	100%	\$0.01	3,950,194
Electric	Multifamily	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	New	46	12	\$6	100%	N/A	\$0.02	0.00
Electric	Multifamily	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	New	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Multifamily	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	703	18	\$1,585	2.5%	95%	\$0.27	0.00
Electric	Multifamily	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	755	18	\$1,585	2.5%	95%	\$0.25	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,005	40	\$1,074	25%	62%	\$0.09	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,005	40	\$1,074	25%	62%	\$0.09	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,206	40	\$1,200	25%	62%	\$0.09	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,206	40	\$1,200	25%	62%	\$0.09	0.00
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	213	40	\$97	100%	62%	\$0.04	13,537,413
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	229	40	\$97	100%	62%	\$0.04	14,354,570
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	126	40	\$26	100%	62%	\$0.02	9,081,565
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	126	40	\$26	100%	62%	\$0.02	9,081,565
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	135	40	\$26	100%	62%	\$0.02	9,699,251
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	135	40	\$26	100%	62%	\$0.02	9,699,251
Electric	Multifamily	Heat Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,090	18	\$1,162	25%	62%	\$0.13	0.00
Electric	Multifamily	Heat Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,170	18	\$1,162	25%	62%	\$0.12	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,365	40	\$765	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,365	40	\$765	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,637	40	\$855	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,637	40	\$855	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	142	11	\$191	75%	92%	\$0.21	0.00
Electric	Multifamily	Heat Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	153	11	\$222	75%	92%	\$0.23	0.00
Electric	Multifamily	Heat Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	205	11	\$33	100%	94%	\$0.03	21,908,917
Electric	Multifamily	Heat Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	220	11	\$33	100%	94%	\$0.02	23,399,060
Electric	Multifamily	Heat Central	Tune-up - Furnace (Electric)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	615	18	\$262	95%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Tune-up - Furnace (Electric)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	660	18	\$262	95%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	260	40	\$108	0.0%	95%	\$0.04	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	260	40	\$108	0.0%	95%	\$0.04	0.00
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	304	40	\$117	0.0%	95%	\$0.03	0.00
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	304	40	\$117	0.0%	95%	\$0.03	0.00
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,428	40	\$611	50%	62%	\$0.04	49,009,227
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,428	40	\$611	50%	62%	\$0.04	49,009,227
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,666	40	\$665	50%	62%	\$0.04	56,909,399
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,666	40	\$665	50%	62%	\$0.04	56,909,399
Electric	Multifamily	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	205	11	\$172	10%	100%	\$0.13	0.00
Electric	Multifamily	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	220	11	\$172	10%	100%	\$0.12	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	707	25	\$3,341	95%	50%	\$0.48	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	707	25	\$3,341	95%	50%	\$0.48	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	878	25	\$3,866	95%	50%	\$0.45	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	878	25	\$3,866	95%	50%	\$0.45	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	153	25	\$834	95%	50%	\$0.55	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	153	25	\$834	95%	50%	\$0.55	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	191	25	\$965	95%	50%	\$0.52	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	191	25	\$965	95%	50%	\$0.52	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	861	25	\$5,820	95%	100%	\$0.69	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	861	25	\$5,820	95%	100%	\$0.69	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,069	25	\$6,737	95%	100%	\$0.64	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,069	25	\$6,737	95%	100%	\$0.64	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	307	25	\$3,314	95%	100%	\$1.10	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	307	25	\$3,314	95%	100%	\$1.10	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	382	25	\$3,836	95%	100%	\$1.02	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	382	25	\$3,836	95%	100%	\$1.02	0.00
Electric	Multifamily	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	489	18	\$1,585	20%	95%	\$0.38	0.00
Electric	Multifamily	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	525	18	\$1,585	20%	95%	\$0.36	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	137	40	\$218	75%	62%	\$0.14	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	137	40	\$218	75%	62%	\$0.14	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	164	40	\$244	75%	62%	\$0.13	0.00
Electric	Multifamily	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	164	40	\$244	75%	62%	\$0.13	0.00
Electric	Multifamily	Heat Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	530	40	\$2,145	5.0%	***	\$0.36	0.00
Electric	Multifamily	Heat Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	569	40	\$2,483	5.0%	***	\$0.39	0.00
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	213	40	\$97	100%	62%	\$0.04	1,767,601
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	213	40	\$97	100%	62%	\$0.04	1,767,601
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	229	40	\$97	100%	62%	\$0.04	1,776,940
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	229	40	\$97	100%	62%	\$0.04	1,776,940
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	126	40	\$26	100%	62%	\$0.02	1,111,568
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	126	40	\$26	100%	62%	\$0.02	1,111,568
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	135	40	\$26	100%	62%	\$0.02	1,121,416
Electric	Multifamily	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	135	40	\$26	100%	62%	\$0.02	1,121,416
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	80	40	\$211	75%	62%	\$0.23	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	80	40	\$211	75%	62%	\$0.23	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	96	40	\$236	75%	62%	\$0.22	0.00
Electric	Multifamily	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	96	40	\$236	75%	62%	\$0.22	0.00
Electric	Multifamily	Heat Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	204	40	\$14,737	10%	***	\$6.41	0.00
Electric	Multifamily	Heat Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	218	40	\$16,235	10%	***	\$6.58	0.00
Electric	Multifamily	Heat Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	375	20	\$495	0.0%	95%	\$0.15	0.00
Electric	Multifamily	Heat Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	403	20	\$574	0.0%	95%	\$0.16	0.00
Electric	Multifamily	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	648	40	\$358	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	648	40	\$358	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	724	40	\$400	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	724	40	\$400	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	246	40	\$102	75%	90%	\$0.04	2,309,074
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	246	40	\$102	75%	90%	\$0.04	2,309,074

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	287	40	\$110	75%	90%	\$0.03	2,523,538
Electric	Multifamily	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	287	40	\$110	75%	90%	\$0.03	2,523,538
Electric	Multifamily	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	142	11	\$172	10%	100%	\$0.19	0.00
Electric	Multifamily	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	153	11	\$172	10%	100%	\$0.18	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	192	25	\$1,043	95%	50%	\$0.55	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	192	25	\$1,043	95%	50%	\$0.55	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	238	25	\$1,207	95%	50%	\$0.52	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	238	25	\$1,207	95%	50%	\$0.52	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	384	25	\$4,143	95%	100%	\$1.10	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	384	25	\$4,143	95%	100%	\$1.10	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	477	25	\$4,795	95%	100%	\$1.02	0.00
Electric	Multifamily	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	477	25	\$4,795	95%	100%	\$1.02	0.00
Electric	Multifamily	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	646	18	\$1,585	2.5%	95%	\$0.29	0.00
Electric	Multifamily	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	648	18	\$1,585	2.5%	95%	\$0.29	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	585	40	\$1,074	25%	62%	\$0.16	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	585	40	\$1,074	25%	62%	\$0.16	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	671	40	\$1,200	25%	62%	\$0.16	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	671	40	\$1,200	25%	62%	\$0.16	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	8	20	\$97	50%	100%	\$1.28	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	8	20	\$97	50%	100%	\$1.28	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	33	20	\$107	50%	100%	\$0.36	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	33	20	\$107	50%	100%	\$0.36	0.00
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	124	40	\$97	100%	62%	\$0.07	3,291,991
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	124	40	\$97	100%	62%	\$0.07	3,291,991
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	127	40	\$97	100%	62%	\$0.07	6,788,249
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	127	40	\$97	100%	62%	\$0.07	6,788,249
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	73	40	\$26	100%	62%	\$0.03	2,056,787
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	73	40	\$26	100%	62%	\$0.03	2,056,787
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	75	40	\$26	100%	62%	\$0.03	4,266,401
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	75	40	\$26	100%	62%	\$0.03	4,266,401
Electric	Multifamily	Heat Pump	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,055	18	\$1,162	25%	62%	\$0.13	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,058	18	\$1,162	25%	62%	\$0.13	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	647	40	\$765	25%	62%	\$0.11	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	647	40	\$765	25%	62%	\$0.11	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	776	40	\$855	25%	62%	\$0.10	9,381,501
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	776	40	\$855	25%	62%	\$0.10	9,381,501
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	572	15	\$808	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	572	15	\$808	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	583	15	\$808	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	583	15	\$808	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	392	15	\$606	100%	N/A	\$0.20	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	392	15	\$606	100%	N/A	\$0.20	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	405	15	\$606	100%	N/A	\$0.20	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	405	15	\$606	100%	N/A	\$0.20	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,163	15	\$2,022	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,163	15	\$2,022	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,189	15	\$2,022	100%	N/A	\$0.22	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,189	15	\$2,022	100%	N/A	\$0.22	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	351	15	\$404	100%	N/A	\$0.15	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	351	15	\$404	100%	N/A	\$0.15	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	354	15	\$404	100%	N/A	\$0.15	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	354	15	\$404	100%	N/A	\$0.15	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	855	15	\$1,213	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	855	15	\$1,213	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	867	15	\$1,213	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	867	15	\$1,213	100%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,039	15	\$5,153	2.5%	N/A	\$0.33	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,039	15	\$5,153	2.5%	N/A	\$0.33	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,044	15	\$5,153	2.5%	N/A	\$0.33	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,044	15	\$5,153	2.5%	N/A	\$0.33	0.00
Electric	Multifamily	Heat Pump	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	97	11	\$222	75%	92%	\$0.36	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	97	11	\$191	75%	92%	\$0.31	0.00
Electric	Multifamily	Heat Pump	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	198	11	\$33	100%	94%	\$0.03	17,476,047
Electric	Multifamily	Heat Pump	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	199	11	\$33	100%	94%	\$0.03	8,670,737
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	650	15	\$412	95%	65%	\$0.08	13,671,997
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	650	15	\$412	95%	65%	\$0.08	13,671,997
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	651	15	\$412	95%	65%	\$0.08	27,719,411
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	651	15	\$412	95%	65%	\$0.08	27,719,411
Electric	Multifamily	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	200	5	\$300	20%	75%	\$0.44	0.00
Electric	Multifamily	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	200	5	\$300	20%	75%	\$0.44	0.00
Electric	Multifamily	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	216	5	\$300	20%	75%	\$0.41	0.00
Electric	Multifamily	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	216	5	\$300	20%	75%	\$0.41	0.00
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	151	40	\$108	0.0%	95%	\$0.06	0.00
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	151	40	\$108	0.0%	95%	\$0.06	0.00
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	169	40	\$117	0.0%	95%	\$0.06	0.00
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	169	40	\$117	0.0%	95%	\$0.06	0.00
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	831	40	\$611	50%	62%	\$0.07	11,538,628
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	831	40	\$611	50%	62%	\$0.07	11,538,628
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	927	40	\$665	50%	62%	\$0.06	26,016,709
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	927	40	\$665	50%	62%	\$0.06	26,016,709
Electric	Multifamily	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	170	20	\$455	5.0%	95%	\$0.30	0.00
Electric	Multifamily	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	170	20	\$455	5.0%	95%	\$0.30	0.00
Electric	Multifamily	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	198	11	\$172	10%	100%	\$0.14	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	199	11	\$172	10%	100%	\$0.14	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	411	25	\$3,341	95%	50%	\$0.83	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	411	25	\$3,341	95%	50%	\$0.83	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	488	25	\$3,866	95%	50%	\$0.81	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	488	25	\$3,866	95%	50%	\$0.81	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	89	25	\$834	95%	50%	\$0.95	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	89	25	\$834	95%	50%	\$0.95	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	106	25	\$965	95%	50%	\$0.93	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	106	25	\$965	95%	50%	\$0.93	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	501	25	\$5,820	95%	100%	\$1.18	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	501	25	\$5,820	95%	100%	\$1.18	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	595	25	\$6,737	95%	100%	\$1.15	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	595	25	\$6,737	95%	100%	\$1.15	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	179	25	\$3,314	95%	100%	\$1.89	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	179	25	\$3,314	95%	100%	\$1.89	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	212	25	\$3,836	95%	100%	\$1.84	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	212	25	\$3,836	95%	100%	\$1.84	0.00
Electric	Multifamily	Heat Pump	Window Film	Window Film	No Film	Savings Per Building	Existing	425	10	\$574	25%	90%	\$0.23	0.00
Electric	Multifamily	Heat Pump	Window Film	Window Film	No Film	Savings Per Building	Existing	426	10	\$495	25%	90%	\$0.20	0.00
Electric	Multifamily	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	495	18	\$1,585	20%	95%	\$0.38	0.00
Electric	Multifamily	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	500	18	\$1,585	20%	95%	\$0.37	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	67	40	\$218	75%	62%	\$0.29	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	67	40	\$218	75%	62%	\$0.29	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	78	40	\$244	75%	62%	\$0.28	0.00
Electric	Multifamily	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	78	40	\$244	75%	62%	\$0.28	0.00
Electric	Multifamily	Heat Pump	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	564	40	\$2,145	5.0%	**%	\$0.34	0.00
Electric	Multifamily	Heat Pump	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	570	40	\$2,483	5.0%	**%	\$0.39	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$97	50%	100%	\$1.68	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$97	50%	100%	\$1.68	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	26	20	\$107	50%	100%	\$0.46	0.00
Electric	Multifamily	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	26	20	\$107	50%	100%	\$0.46	0.00
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	105	40	\$97	100%	62%	\$0.08	381,535
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	105	40	\$97	100%	62%	\$0.08	381,535
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	108	40	\$97	100%	62%	\$0.08	741,572
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	108	40	\$97	100%	62%	\$0.08	741,572
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	62	40	\$26	100%	62%	\$0.04	232,125
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	62	40	\$26	100%	62%	\$0.04	232,125
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	64	40	\$26	100%	62%	\$0.04	452,195
Electric	Multifamily	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	64	40	\$26	100%	62%	\$0.04	452,195
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	33	40	\$211	75%	62%	\$0.56	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	33	40	\$211	75%	62%	\$0.56	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	40	40	\$236	75%	62%	\$0.52	0.00
Electric	Multifamily	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	40	40	\$236	75%	62%	\$0.52	0.00
Electric	Multifamily	Heat Pump	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	217	40	\$14,737	10%	**%	\$6.02	0.00
Electric	Multifamily	Heat Pump	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	219	40	\$16,235	10%	**%	\$6.56	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	455	15	\$808	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	455	15	\$808	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	458	15	\$808	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	458	15	\$808	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	310	15	\$606	100%	N/A	\$0.26	8
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	310	15	\$606	100%	N/A	\$0.26	8

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	315	15	\$606	100%	N/A	\$0.25	1
Electric	Multifamily	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	315	15	\$606	100%	N/A	\$0.25	1
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	925	15	\$2,022	100%	N/A	\$0.29	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	925	15	\$2,022	100%	N/A	\$0.29	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	934	15	\$2,022	100%	N/A	\$0.28	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	934	15	\$2,022	100%	N/A	\$0.28	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	281	15	\$404	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	281	15	\$404	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	281	15	\$404	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	281	15	\$404	100%	N/A	\$0.19	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	683	15	\$1,213	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	683	15	\$1,213	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	685	15	\$1,213	100%	N/A	\$0.23	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	685	15	\$1,213	100%	N/A	\$0.23	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,632	15	\$5,234	5.0%	N/A	\$0.42	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,632	15	\$5,234	5.0%	N/A	\$0.42	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,653	15	\$5,234	5.0%	N/A	\$0.41	0.00
Electric	Multifamily	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,653	15	\$5,234	5.0%	N/A	\$0.41	0.00
Electric	Multifamily	Heat Pump	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	256	20	\$495	0.0%	95%	\$0.22	0.00
Electric	Multifamily	Heat Pump	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	259	20	\$574	0.0%	95%	\$0.25	0.00
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	498	15	\$412	95%	65%	\$0.11	0.00
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	498	15	\$412	95%	65%	\$0.11	0.00
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	506	15	\$412	95%	65%	\$0.11	2,973,712
Electric	Multifamily	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	506	15	\$412	95%	65%	\$0.11	2,973,712
Electric	Multifamily	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	269	40	\$358	20%	75%	\$0.12	0.00
Electric	Multifamily	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	269	40	\$358	20%	75%	\$0.12	0.00
Electric	Multifamily	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	301	40	\$400	20%	75%	\$0.12	450,404
Electric	Multifamily	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	301	40	\$400	20%	75%	\$0.12	450,404

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	121	40	\$102	75%	90%	\$0.07	487,282
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	121	40	\$102	75%	90%	\$0.07	487,282
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	136	40	\$110	75%	90%	\$0.07	1,028,108
Electric	Multifamily	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	136	40	\$110	75%	90%	\$0.07	1,028,108
Electric	Multifamily	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	130	20	\$455	5.0%	95%	\$0.39	0.00
Electric	Multifamily	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	131	20	\$455	5.0%	95%	\$0.39	0.00
Electric	Multifamily	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	152	11	\$172	10%	100%	\$0.18	0.00
Electric	Multifamily	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	153	11	\$172	10%	100%	\$0.18	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	94	25	\$1,043	95%	50%	\$1.12	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	94	25	\$1,043	95%	50%	\$1.12	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	113	25	\$1,207	95%	50%	\$1.08	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	113	25	\$1,207	95%	50%	\$1.08	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	189	25	\$4,143	95%	100%	\$2.23	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	189	25	\$4,143	95%	100%	\$2.23	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	226	25	\$4,795	95%	100%	\$2.15	0.00
Electric	Multifamily	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	226	25	\$4,795	95%	100%	\$2.15	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	251	40	\$1,074	25%	62%	\$0.38	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	251	40	\$1,074	25%	62%	\$0.38	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	301	40	\$1,200	25%	62%	\$0.35	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	301	40	\$1,200	25%	62%	\$0.35	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	53	40	\$97	100%	62%	\$0.16	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	53	40	\$97	100%	62%	\$0.16	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	57	40	\$97	100%	62%	\$0.15	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	57	40	\$97	100%	62%	\$0.15	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	31	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	31	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	33	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	33	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	2,975	15	\$3,938	25%	N/A	\$0.16	0.00
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	2,975	15	\$3,938	25%	N/A	\$0.16	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	3,192	15	\$4,558	25%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	3,192	15	\$4,558	25%	N/A	\$0.18	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,365	40	\$765	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,365	40	\$765	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,637	40	\$855	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,637	40	\$855	25%	62%	\$0.05	0.00
Electric	Multifamily	Heat Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	108	11	\$191	75%	92%	\$0.28	0.00
Electric	Multifamily	Heat Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	116	11	\$222	75%	92%	\$0.30	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	65	40	\$108	0.0%	95%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	65	40	\$108	0.0%	95%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	76	40	\$117	0.0%	95%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	76	40	\$117	0.0%	95%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	357	40	\$611	50%	62%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	357	40	\$611	50%	62%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	416	40	\$665	50%	62%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	416	40	\$665	50%	62%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	155	11	\$172	10%	100%	\$0.18	0.00
Electric	Multifamily	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	167	11	\$172	10%	100%	\$0.16	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	176	25	\$3,341	95%	50%	\$1.92	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	176	25	\$3,341	95%	50%	\$1.92	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	219	25	\$3,866	95%	50%	\$1.79	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	219	25	\$3,866	95%	50%	\$1.79	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	38	25	\$834	95%	50%	\$2.21	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	38	25	\$834	95%	50%	\$2.21	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	47	25	\$965	95%	50%	\$2.06	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	47	25	\$965	95%	50%	\$2.06	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	215	25	\$5,820	95%	100%	\$2.75	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	215	25	\$5,820	95%	100%	\$2.75	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	267	25	\$6,737	95%	100%	\$2.57	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	267	25	\$6,737	95%	100%	\$2.57	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	76	25	\$3,314	95%	100%	\$4.39	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	76	25	\$3,314	95%	100%	\$4.39	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	95	25	\$3,836	95%	100%	\$4.09	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	95	25	\$3,836	95%	100%	\$4.09	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	34	40	\$218	75%	62%	\$0.57	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	34	40	\$218	75%	62%	\$0.57	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	41	40	\$244	75%	62%	\$0.53	0.00
Electric	Multifamily	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	41	40	\$244	75%	62%	\$0.53	0.00
Electric	Multifamily	Heat Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	403	40	\$2,145	5.0%	***	\$0.47	0.00
Electric	Multifamily	Heat Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	432	40	\$2,483	5.0%	***	\$0.51	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	53	40	\$97	100%	62%	\$0.16	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	57	40	\$97	100%	62%	\$0.15	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	31	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	31	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	33	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	33	40	\$26	100%	62%	\$0.07	0.00
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	New	2,070	15	\$3,938	95%	N/A	\$0.25	0.00
Electric	Multifamily	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	New	2,222	15	\$4,558	95%	N/A	\$0.27	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	80	40	\$211	75%	62%	\$0.23	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	80	40	\$211	75%	62%	\$0.23	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	96	40	\$236	75%	62%	\$0.22	0.00
Electric	Multifamily	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	96	40	\$236	75%	62%	\$0.22	0.00
Electric	Multifamily	Heat Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	155	40	\$14,737	10%	***	\$8.44	0.00
Electric	Multifamily	Heat Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	166	40	\$16,235	10%	***	\$8.66	0.00
Electric	Multifamily	Heat Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	301	20	\$495	0.0%	95%	\$0.18	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Heat Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	323	20	\$574	0.0%	95%	\$0.20	0.00
Electric	Multifamily	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	648	40	\$358	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	648	40	\$358	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	724	40	\$400	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	724	40	\$400	20%	75%	\$0.05	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	61	40	\$102	75%	90%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	61	40	\$102	75%	90%	\$0.15	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	71	40	\$110	75%	90%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	71	40	\$110	75%	90%	\$0.14	0.00
Electric	Multifamily	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	108	11	\$172	10%	100%	\$0.25	0.00
Electric	Multifamily	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	116	11	\$172	10%	100%	\$0.23	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	48	25	\$1,043	95%	50%	\$2.21	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	48	25	\$1,043	95%	50%	\$2.21	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	59	25	\$1,207	95%	50%	\$2.06	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	59	25	\$1,207	95%	50%	\$2.06	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	96	25	\$4,143	95%	100%	\$4.39	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	96	25	\$4,143	95%	100%	\$4.39	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	119	25	\$4,795	95%	100%	\$4.09	0.00
Electric	Multifamily	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	119	25	\$4,795	95%	100%	\$4.09	0.00
Electric	Multifamily	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	Existing	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Multifamily	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	New	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	22	7	\$1	50%	N/A	\$-0.04	18,247,436
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	22	7	\$1	50%	N/A	\$-0.04	18,247,436
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	23	7	\$1	50%	N/A	\$-0.04	21,248,628
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	23	7	\$1	50%	N/A	\$-0.04	21,248,628
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	12	\$37	85%	N/A	\$0.17	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	22	7	\$1	50%	N/A	-\$0.04	2,767,192
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	22	7	\$1	50%	N/A	-\$0.04	2,767,192
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	23	7	\$1	50%	N/A	-\$0.04	3,415,066
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	23	7	\$1	50%	N/A	-\$0.04	3,415,066
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	25	12	\$37	85%	N/A	\$0.17	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	Existing	6	10	\$60	2.5%	90%	\$1.66	0.00
Electric	Multifamily	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	Existing	6	10	\$60	2.5%	90%	\$1.66	0.00
Electric	Multifamily	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	Existing	4	10	\$68	5.0%	40%	\$2.81	0.00
Electric	Multifamily	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	Existing	4	10	\$68	5.0%	40%	\$2.80	0.00
Electric	Multifamily	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	Existing	4	10	\$68	2.3%	40%	\$2.81	0.00
Electric	Multifamily	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	Existing	4	10	\$68	2.3%	40%	\$2.80	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	10	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	-\$0.01	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	27	5	\$1	100%	N/A	\$-0.01	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	30	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	30	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	31	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	31	12	\$21	100%	N/A	\$0.08	0.00
Electric	Multifamily	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	New	6	10	\$60	2.5%	90%	\$1.66	0.00
Electric	Multifamily	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	New	6	10	\$60	2.5%	90%	\$1.66	0.00
Electric	Multifamily	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	New	4	10	\$68	5.0%	40%	\$2.81	0.00
Electric	Multifamily	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	New	4	10	\$68	5.0%	40%	\$2.80	0.00
Electric	Multifamily	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	New	4	10	\$68	2.3%	40%	\$2.81	0.00
Electric	Multifamily	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	New	4	10	\$68	2.3%	40%	\$2.80	0.00
Electric	Multifamily	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	Existing	14	5	\$1.00	100%	N/A	\$0.02	274,603
Electric	Multifamily	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	Existing	14	5	\$1.00	100%	N/A	\$0.02	351,532
Electric	Multifamily	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	New	14	5	\$1.00	100%	N/A	\$0.02	67,524
Electric	Multifamily	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	New	14	5	\$1.00	100%	N/A	\$0.02	91,557
Electric	Multifamily	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	Existing	149	6	\$1.00	100%	N/A	\$0.00	1,475,994
Electric	Multifamily	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	Existing	149	6	\$1.00	100%	N/A	\$0.00	1,678,738
Electric	Multifamily	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	New	149	6	\$1.00	100%	N/A	\$0.00	0.00
Electric	Multifamily	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	Existing	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Multifamily	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	New	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Multifamily	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	Existing	91	5	\$1.00	100%	N/A	\$0.00	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	New	91	5	\$1.00	100%	N/A	\$0.00	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	125	12	\$472	100%	N/A	\$0.57	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	125	12	\$472	100%	N/A	\$0.57	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	128	12	\$472	100%	N/A	\$0.55	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	128	12	\$472	100%	N/A	\$0.55	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	150	12	\$633	100%	N/A	\$0.63	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	150	12	\$633	100%	N/A	\$0.63	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	153	12	\$633	100%	N/A	\$0.62	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	153	12	\$633	100%	N/A	\$0.62	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	100	12	\$37	100%	N/A	\$0.06	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	100	12	\$37	100%	N/A	\$0.06	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	102	12	\$37	100%	N/A	\$0.05	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	102	12	\$37	100%	N/A	\$0.05	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	49	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	49	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	50	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	50	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Removal of Secondary	Proper Disposal of Refrigerator	Existing Non-Efficient Refrigerator	Savings Per Building	Existing	1,140	5	\$30	2.9%	100%	\$0.01	3,858,915
Electric	Multifamily	Refrigerator	Refrigerator - Removal of Secondary	Proper Disposal of Refrigerator	Existing Non-Efficient Refrigerator	Savings Per Building	Existing	1,140	5	\$30	2.9%	100%	\$0.01	4,904,800
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	125	12	\$472	100%	N/A	\$0.57	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	125	12	\$472	100%	N/A	\$0.57	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	128	12	\$472	100%	N/A	\$0.55	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	128	12	\$472	100%	N/A	\$0.55	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	150	12	\$633	100%	N/A	\$0.63	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	150	12	\$633	100%	N/A	\$0.63	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	153	12	\$633	100%	N/A	\$0.62	0.00
Electric	Multifamily	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	153	12	\$633	100%	N/A	\$0.62	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	100	12	\$37	100%	N/A	\$0.06	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	100	12	\$37	100%	N/A	\$0.06	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	102	12	\$37	100%	N/A	\$0.05	0.00
Electric	Multifamily	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	102	12	\$37	100%	N/A	\$0.05	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	49	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	49	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	50	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	50	12	\$22	100%	N/A	\$0.07	0.00
Electric	Multifamily	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	Existing	201	5	\$6	100%	N/A	\$0.01	16,781,435
Electric	Multifamily	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	Existing	201	5	\$6	100%	N/A	\$0.01	18,989,167
Electric	Multifamily	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	New	201	5	\$6	100%	N/A	\$0.01	1,661,556
Electric	Multifamily	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	New	201	5	\$6	100%	N/A	\$0.01	1,991,430
Electric	Multifamily	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	Existing	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Multifamily	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	New	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	209	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	209	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	214	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	214	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	209	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	209	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	214	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	214	20	\$120	100%	N/A	\$0.06	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	1,797	13	\$1,684	25%	N/A	\$0.15	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	1,797	13	\$1,684	25%	N/A	\$0.15	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	1,903	13	\$1,684	25%	N/A	\$0.14	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	1,903	13	\$1,684	25%	N/A	\$0.14	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	15	13	\$1,003	25%	N/A	\$11.04	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	15	13	\$1,003	25%	N/A	\$11.04	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	40	13	\$1,003	25%	N/A	\$4.12	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	40	13	\$1,003	25%	N/A	\$4.12	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,808	20	\$5,517	20%	N/A	\$0.36	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,890	20	\$5,517	20%	N/A	\$0.35	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	1,797	13	\$1,684	25%	N/A	\$0.15	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	1,797	13	\$1,684	25%	N/A	\$0.15	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	1,903	13	\$1,684	25%	N/A	\$0.14	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	1,903	13	\$1,684	25%	N/A	\$0.14	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	15	13	\$1,003	25%	N/A	\$11.04	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	15	13	\$1,003	25%	N/A	\$11.04	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	40	13	\$1,003	25%	N/A	\$4.12	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	40	13	\$1,003	25%	N/A	\$4.12	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,808	20	\$5,517	20%	N/A	\$0.36	0.00
Electric	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,890	20	\$5,517	20%	N/A	\$0.35	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	162	11	\$140	60%	38%	\$0.14	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	242	11	\$198	60%	38%	\$0.13	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	224	11	\$152	60%	38%	\$0.11	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	38	11	\$161	33%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	38	11	\$161	33%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	44	11	\$161	33%	77%	\$0.58	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	44	11	\$161	33%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	7	11	\$7	33%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	7	11	\$7	33%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	8	11	\$7	33%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	8	11	\$7	33%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	35	11	\$154	59%	77%	\$0.69	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	35	11	\$154	59%	77%	\$0.69	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	354	40	\$935	0.5%	**%	\$0.23	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	370	40	\$935	0.5%	**%	\$0.22	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	59	10	\$3	100%	25%	\$0.01	567,507
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	59	10	\$3	100%	25%	\$0.01	567,507
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	62	10	\$3	100%	25%	\$0.01	651,275
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	62	10	\$3	100%	25%	\$0.01	651,275
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	52	10	\$1	50%	65%	\$0.00	645,539
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	52	10	\$1	50%	65%	\$0.00	645,539
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	54	10	\$1	50%	65%	\$0.00	740,825
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	54	10	\$1	50%	65%	\$0.00	740,825
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	126	10	\$5	50%	95%	\$0.01	2,291,312
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	126	10	\$5	50%	95%	\$0.01	2,291,312
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	132	10	\$5	50%	95%	\$0.01	2,629,523
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	132	10	\$5	50%	95%	\$0.01	2,629,523
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	191	10	\$9	100%	65%	\$0.01	4,753,191
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	191	10	\$9	100%	65%	\$0.01	4,753,191
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	211	10	\$9	100%	65%	\$0.01	5,761,646
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	211	10	\$9	100%	65%	\$0.01	5,761,646
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	191	10	\$29	100%	10%	\$0.03	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	191	10	\$29	100%	10%	\$0.03	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	211	10	\$29	100%	10%	\$0.02	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	211	10	\$29	100%	10%	\$0.02	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	503,457
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	524,434
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	503,457

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	524,434
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	210	11	\$198	60%	38%	\$0.15	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	38	11	\$161	33%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	38	11	\$161	33%	77%	\$0.66	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	44	11	\$161	33%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	44	11	\$161	33%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	7	11	\$7	33%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	7	11	\$7	33%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	8	11	\$7	33%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	8	11	\$7	33%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	35	11	\$154	59%	77%	\$0.69	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	35	11	\$154	59%	77%	\$0.69	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	353	40	\$935	0.5%	**%	\$0.24	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	369	40	\$935	0.5%	**%	\$0.22	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	52	10	\$1	50%	65%	\$0.00	91,243
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	52	10	\$1	50%	65%	\$0.00	91,243
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	54	10	\$1	50%	65%	\$0.00	110,779
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	54	10	\$1	50%	65%	\$0.00	110,779
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	126	10	\$5	50%	95%	\$0.01	323,864
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	126	10	\$5	50%	95%	\$0.01	323,864
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	132	10	\$5	50%	95%	\$0.01	393,205
Electric	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	132	10	\$5	50%	95%	\$0.01	393,205
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	191	10	\$9	100%	65%	\$0.01	671,837
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	191	10	\$9	100%	65%	\$0.01	671,837
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	211	10	\$9	100%	65%	\$0.01	861,567
Electric	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	211	10	\$9	100%	65%	\$0.01	861,567
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,519	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,519	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,613	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,613	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,808	20	\$5,517	20%	N/A	\$0.36	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,890	20	\$5,517	20%	N/A	\$0.35	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	91	13	\$72	100%	N/A	\$0.11	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	91	13	\$72	100%	N/A	\$0.11	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	95	13	\$72	100%	N/A	\$0.11	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	95	13	\$72	100%	N/A	\$0.11	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,519	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,519	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,613	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,613	13	\$1,123	25%	N/A	\$0.12	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,808	20	\$5,517	20%	N/A	\$0.36	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,890	20	\$5,517	20%	N/A	\$0.35	0.00
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	91	13	\$72	100%	N/A	\$0.11	-258.112524
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	91	13	\$72	100%	N/A	\$0.11	-258.112524
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	95	13	\$72	100%	N/A	\$0.11	-750.089016
Electric	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	95	13	\$72	100%	N/A	\$0.11	-750.089016
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	162	11	\$140	60%	38%	\$0.14	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	242	11	\$198	60%	38%	\$0.13	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	224	11	\$152	60%	38%	\$0.11	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	38	11	\$161	59%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	38	11	\$161	59%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	44	11	\$161	59%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	44	11	\$161	59%	77%	\$0.58	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	7	11	\$7	59%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	7	11	\$7	59%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	8	11	\$7	59%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	8	11	\$7	59%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	35	11	\$154	59%	77%	\$0.69	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	35	11	\$154	59%	77%	\$0.69	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	354	40	\$935	0.5%	**%	\$0.23	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	370	40	\$935	0.5%	**%	\$0.22	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	59	10	\$3	100%	25%	\$0.01	2,132,447
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	59	10	\$3	100%	25%	\$0.01	2,132,447
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	62	10	\$3	100%	25%	\$0.01	1,474,035
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	62	10	\$3	100%	25%	\$0.01	1,474,035
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	52	10	\$1	50%	65%	\$0.00	2,425,659
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	52	10	\$1	50%	65%	\$0.00	2,425,659
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	54	10	\$1	50%	65%	\$0.00	1,676,715
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	54	10	\$1	50%	65%	\$0.00	1,676,715
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	126	10	\$5	50%	95%	\$0.01	8,609,757
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	126	10	\$5	50%	95%	\$0.01	8,609,757
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	132	10	\$5	50%	95%	\$0.01	5,951,418
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	132	10	\$5	50%	95%	\$0.01	5,951,418
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	191	10	\$9	100%	65%	\$0.01	17,860,432
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	191	10	\$9	100%	65%	\$0.01	17,860,432
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	211	10	\$9	100%	65%	\$0.01	13,040,371
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	211	10	\$9	100%	65%	\$0.01	13,040,371
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	191	10	\$29	100%	10%	\$0.03	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	191	10	\$29	100%	10%	\$0.03	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	211	10	\$29	100%	10%	\$0.02	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	211	10	\$29	100%	10%	\$0.02	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	1,186,956
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	1,891,774
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	1,186,956
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	85%	30%	\$0.01	1,891,774

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	162	11	\$140	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	186	11	\$140	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	58	11	\$58	60%	38%	\$0.16	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	66	11	\$58	60%	38%	\$0.14	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	282	11	\$210	60%	38%	\$0.12	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	325	11	\$210	60%	38%	\$0.10	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	210	11	\$198	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	210	11	\$198	60%	38%	\$0.15	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	242	11	\$198	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	106	11	\$116	60%	38%	\$0.17	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	122	11	\$116	60%	38%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	331	11	\$268	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	380	11	\$268	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	224	11	\$152	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	258	11	\$152	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	120	11	\$70	60%	38%	\$0.09	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	138	11	\$70	60%	38%	\$0.08	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	104	11	\$81	60%	38%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	119	11	\$81	60%	38%	\$0.11	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	38	11	\$161	59%	77%	\$0.66	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	38	11	\$161	59%	77%	\$0.66	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	44	11	\$161	59%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	44	11	\$161	59%	77%	\$0.58	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	7	11	\$7	59%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	7	11	\$7	59%	77%	\$0.15	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	8	11	\$7	59%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	8	11	\$7	59%	77%	\$0.13	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	67	11	\$309	59%	77%	\$0.73	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	77	11	\$309	59%	77%	\$0.63	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	36	11	\$155	59%	77%	\$0.67	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	42	11	\$155	59%	77%	\$0.59	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	30	11	\$154	59%	77%	\$0.79	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	35	11	\$154	59%	77%	\$0.69	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	35	11	\$154	59%	77%	\$0.69	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	339	40	\$935	0.5%	**%	\$0.24	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	355	40	\$935	0.5%	**%	\$0.23	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	52	10	\$1	50%	65%	\$0.00	337,048
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	52	10	\$1	50%	65%	\$0.00	337,048
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	54	10	\$1	50%	65%	\$0.00	246,796
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	54	10	\$1	50%	65%	\$0.00	246,796
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	126	10	\$5	50%	95%	\$0.01	1,196,338
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	126	10	\$5	50%	95%	\$0.01	1,196,338
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	132	10	\$5	50%	95%	\$0.01	875,992
Electric	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	132	10	\$5	50%	95%	\$0.01	875,992
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	191	10	\$9	100%	65%	\$0.01	2,481,732
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	191	10	\$9	100%	65%	\$0.01	2,481,732
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	211	10	\$9	100%	65%	\$0.01	1,919,418
Electric	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	211	10	\$9	100%	65%	\$0.01	1,919,418
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Single Family	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	Existing	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Single Family	Computer	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Installation	New	76	4	\$17	100%	N/A	\$0.08	0.00
Electric	Single Family	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	Existing	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Single Family	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	New	2	19	\$66	100%	N/A	\$2.83	0.00
Electric	Single Family	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	265	18	\$1,585	13%	95%	\$0.71	0.00
Electric	Single Family	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	323	18	\$1,585	13%	95%	\$0.58	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	143	40	\$1,422	85%	64%	\$0.88	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	143	40	\$1,422	85%	64%	\$0.88	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	156	40	\$1,882	85%	64%	\$1.07	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	156	40	\$1,882	85%	64%	\$1.07	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	457	15	\$1,625	100%	N/A	\$0.46	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	559	15	\$1,625	100%	N/A	\$0.38	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	252	15	\$812	100%	N/A	\$0.42	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	252	15	\$812	100%	N/A	\$0.42	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	308	15	\$812	100%	N/A	\$0.34	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	308	15	\$812	100%	N/A	\$0.34	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	678	15	\$2,708	100%	N/A	\$0.52	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	678	15	\$2,708	100%	N/A	\$0.52	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	828	15	\$2,708	100%	N/A	\$0.43	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	828	15	\$2,708	100%	N/A	\$0.43	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	174	15	\$541	100%	N/A	\$0.41	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	212	15	\$541	100%	N/A	\$0.33	0.00
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	2,044	15	\$-2001.4473	0.3%	N/A	\$-0.13	3,121,512

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	2,044	15	\$-2001.4473	0.3%	N/A	\$-0.13	3,121,512
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	2,583	15	\$-2001.4473	0.3%	N/A	\$-0.10	4,831,504
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	Existing	2,583	15	\$-2001.4473	0.3%	N/A	\$-0.10	4,831,504
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	51	20	\$125	75%	99%	\$0.28	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	51	20	\$125	75%	99%	\$0.28	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	55	20	\$164	75%	99%	\$0.33	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	55	20	\$164	75%	99%	\$0.33	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	37	40	\$194	100%	64%	\$0.46	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	37	40	\$194	100%	64%	\$0.46	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	46	40	\$194	100%	64%	\$0.37	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	46	40	\$194	100%	64%	\$0.37	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	27	40	\$52	100%	64%	\$0.17	23,283,696
Electric	Single Family	Cool Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	492	18	\$1,162	25%	64%	\$0.28	0.00
Electric	Single Family	Cool Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	601	18	\$1,162	25%	64%	\$0.23	0.00
Electric	Single Family	Cool Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	34	11	\$418	75%	62%	\$1.96	0.00
Electric	Single Family	Cool Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	41	11	\$320	75%	62%	\$1.23	0.00
Electric	Single Family	Cool Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	92	11	\$33	100%	72%	\$0.06	75,445,411
Electric	Single Family	Cool Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	113	11	\$33	100%	72%	\$0.05	11,318,807
Electric	Single Family	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	Existing	278	18	\$262	95%	65%	\$0.11	43,298,546
Electric	Single Family	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	Existing	339	18	\$262	95%	65%	\$0.09	11,435,302
Electric	Single Family	Cool Central	Tune-up - Central Air Conditioner	Central Air Conditioner with Tune-up	Central Air Conditioner with no Tune-up	Savings Per Building	Existing	198	5	\$300	95%	75%	\$0.44	0.00
Electric	Single Family	Cool Central	Tune-up - Central Air Conditioner	Central Air Conditioner with Tune-up	Central Air Conditioner with no Tune-up	Savings Per Building	Existing	242	5	\$300	95%	75%	\$0.36	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	79	40	\$370	0.0%	95%	\$0.42	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	79	40	\$370	0.0%	95%	\$0.42	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	86	40	\$332	0.0%	95%	\$0.34	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	86	40	\$332	0.0%	95%	\$0.34	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	433	40	\$2,096	75%	64%	\$0.43	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	433	40	\$2,096	75%	64%	\$0.43	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	475	40	\$1,881	75%	64%	\$0.35	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	475	40	\$1,881	75%	64%	\$0.35	0.00
Electric	Single Family	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	397	20	\$455	50%	95%	\$0.13	14,733.087
Electric	Single Family	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	485	20	\$455	50%	95%	\$0.11	16,836.117
Electric	Single Family	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	92	11	\$172	95%	100%	\$0.30	0.00
Electric	Single Family	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	113	11	\$172	95%	100%	\$0.24	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	178	25	\$7,807	95%	44%	\$4.45	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	178	25	\$7,807	95%	44%	\$4.45	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	191	25	\$10,205	95%	44%	\$5.43	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	191	25	\$10,205	95%	44%	\$5.43	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	217	25	\$13,602	95%	99%	\$6.37	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	217	25	\$13,602	95%	99%	\$6.37	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	232	25	\$17,780	95%	99%	\$7.78	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	232	25	\$17,780	95%	99%	\$7.78	0.00
Electric	Single Family	Cool Central	Window Film	Window Film	No Film	Savings Per Building	Existing	198	10	\$1,515	50%	90%	\$1.30	0.00
Electric	Single Family	Cool Central	Window Film	Window Film	No Film	Savings Per Building	Existing	242	10	\$1,159	50%	90%	\$0.81	0.00
Electric	Single Family	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	143	18	\$1,585	45%	95%	\$1.31	0.00
Electric	Single Family	Cool Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	175	18	\$1,585	45%	95%	\$1.07	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	14	40	\$289	95%	64%	\$1.83	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	14	40	\$289	95%	64%	\$1.83	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	15	40	\$383	95%	64%	\$2.23	0.00
Electric	Single Family	Cool Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	15	40	\$383	95%	64%	\$2.23	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	273	15	\$1,625	100%	N/A	\$0.78	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - CEE Tier 3	CEE Tier 3 Central Air Conditioner - SEER/ EER 16/13 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	333	15	\$1,625	100%	N/A	\$0.64	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	150	15	\$812	100%	N/A	\$0.70	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - ENERGY STAR	ENERGY STAR Central Air Conditioner - SEER/ EER 14.5/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	184	15	\$812	100%	N/A	\$0.58	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	405	15	\$2,708	100%	N/A	\$0.87	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Enhanced	Enhanced Central Air Conditioner - SEER/ EER 18/14 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	494	15	\$2,708	100%	N/A	\$0.72	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	104	15	\$541	100%	N/A	\$0.68	0.00
Electric	Single Family	Cool Central	Central Air Conditioner - Federal Standard 2015	Federal Standard 2015 Central Air Conditioner - SEER/ EER 14/12 (Split System)	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	127	15	\$541	100%	N/A	\$0.56	0.00
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	1,060	15	-\$2001.4473	0.3%	N/A	-\$0.25	387,217
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	1,060	15	-\$2001.4473	0.3%	N/A	-\$0.25	387,217
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	1,382	15	-\$2001.4473	0.3%	N/A	-\$0.19	647,480
Electric	Single Family	Cool Central	Central Cooling - Evaporative Cooler	Evaporative Cooler	Federal Standard 2006 Central Air Conditioner - SEER/ EER 13/11 (Split System)	Per Installation	New	1,382	15	-\$2001.4473	0.3%	N/A	-\$0.19	647,480
Electric	Single Family	Cool Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	186	40	\$4,681	25%	**%	\$2.23	0.00
Electric	Single Family	Cool Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	227	40	\$3,581	25%	**%	\$1.40	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	27	20	\$125	75%	99%	\$0.51	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	27	20	\$125	75%	99%	\$0.51	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	30	20	\$164	75%	99%	\$0.61	0.00
Electric	Single Family	Cool Central	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	30	20	\$164	75%	99%	\$0.61	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	27	40	\$194	100%	64%	\$0.64	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	27	40	\$194	100%	64%	\$0.64	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	32	40	\$194	100%	64%	\$0.52	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	32	40	\$194	100%	64%	\$0.52	0.00
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	15	40	\$52	100%	64%	\$0.29	1,427,346
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	15	40	\$52	100%	64%	\$0.29	1,427,346
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	19	40	\$52	100%	64%	\$0.24	2,242,536
Electric	Single Family	Cool Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	19	40	\$52	100%	64%	\$0.24	2,242,536
Electric	Single Family	Cool Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	71	40	\$24,917	10%	***	\$30.84	0.00
Electric	Single Family	Cool Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	87	40	\$18,975	10%	***	\$19.24	0.00
Electric	Single Family	Cool Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	44	20	\$1,082	85%	95%	\$2.73	0.00
Electric	Single Family	Cool Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	54	20	\$827	85%	95%	\$1.71	0.00
Electric	Single Family	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	New	150	18	\$262	95%	65%	\$0.21	0.00
Electric	Single Family	Cool Central	Quality Installation - Central Air Conditioner	Quality Installation of Central Air Conditioner - Commissioning, Controls, and Proper Sizing	Standard Installation of Central Air Conditioner	Savings Per Building	New	183	18	\$262	95%	65%	\$0.17	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	54	40	\$355	75%	90%	\$0.58	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	54	40	\$355	75%	90%	\$0.58	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	59	40	\$321	75%	90%	\$0.48	0.00
Electric	Single Family	Cool Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	59	40	\$321	75%	90%	\$0.48	0.00
Electric	Single Family	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	215	20	\$455	50%	95%	\$0.24	0.00
Electric	Single Family	Cool Central	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	262	20	\$455	50%	95%	\$0.19	0.00
Electric	Single Family	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	50	11	\$172	95%	100%	\$0.55	0.00
Electric	Single Family	Cool Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	61	11	\$172	95%	100%	\$0.45	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	33	25	\$2,368	95%	44%	\$7.16	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	33	25	\$2,368	95%	44%	\$7.16	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	36	25	\$3,095	95%	44%	\$8.74	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	36	25	\$3,095	95%	44%	\$8.74	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	67	25	\$9,405	95%	99%	\$14.22	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	67	25	\$9,405	95%	99%	\$14.22	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	72	25	\$12,293	95%	99%	\$17.35	0.00
Electric	Single Family	Cool Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	72	25	\$12,293	95%	99%	\$17.35	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	39	40	\$1,422	85%	64%	\$3.16	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	39	40	\$1,422	85%	64%	\$3.16	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	43	40	\$1,882	85%	64%	\$3.85	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	43	40	\$1,882	85%	64%	\$3.85	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$125	75%	99%	\$2.32	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$125	75%	99%	\$2.32	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$164	75%	99%	\$2.79	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	6	20	\$164	75%	99%	\$2.79	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	10	40	\$194	100%	64%	\$1.64	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	10	40	\$194	100%	64%	\$1.64	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	12	40	\$194	100%	64%	\$1.35	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	12	40	\$194	100%	64%	\$1.35	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	6	40	\$52	100%	64%	\$0.74	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	6	40	\$52	100%	64%	\$0.74	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	7	40	\$52	100%	64%	\$0.61	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	7	40	\$52	100%	64%	\$0.61	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	69	15	\$10,807	50%	N/A	\$17.80	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	69	15	\$10,807	50%	N/A	\$17.80	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	85	15	\$8,267	50%	N/A	\$11.16	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	85	15	\$8,267	50%	N/A	\$11.16	0.00
Electric	Single Family	Cool Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	4	11	\$418	75%	62%	\$16.49	0.00
Electric	Single Family	Cool Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	4	11	\$320	75%	62%	\$10.33	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	Existing	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	21	40	\$370	0.0%	95%	\$1.50	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	21	40	\$370	0.0%	95%	\$1.50	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	24	40	\$332	0.0%	95%	\$1.23	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	24	40	\$332	0.0%	95%	\$1.23	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	120	40	\$2,096	75%	64%	\$1.55	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	120	40	\$2,096	75%	64%	\$1.55	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	131	40	\$1,881	75%	64%	\$1.27	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	131	40	\$1,881	75%	64%	\$1.27	0.00
Electric	Single Family	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	11	11	\$172	95%	100%	\$2.49	0.00
Electric	Single Family	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	13	11	\$172	95%	100%	\$2.04	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	49	25	\$7,807	95%	44%	\$16.02	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	49	25	\$7,807	95%	44%	\$16.02	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	53	25	\$10,205	95%	44%	\$19.56	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	53	25	\$10,205	95%	44%	\$19.56	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	10	25	\$1,950	95%	44%	\$18.41	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	10	25	\$1,950	95%	44%	\$18.41	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	11	25	\$2,549	95%	44%	\$22.47	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	11	25	\$2,549	95%	44%	\$22.47	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	60	25	\$13,602	95%	99%	\$22.93	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	60	25	\$13,602	95%	99%	\$22.93	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	64	25	\$17,780	95%	99%	\$27.99	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	64	25	\$17,780	95%	99%	\$27.99	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	21	25	\$7,745	95%	99%	\$36.56	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	21	25	\$7,745	95%	99%	\$36.56	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	23	25	\$10,124	95%	99%	\$44.63	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	23	25	\$10,124	95%	99%	\$44.63	0.00
Electric	Single Family	Cool Room	Window Film	Window Film	No Film	Savings Per Building	Existing	23	10	\$1,515	50%	90%	\$10.92	0.00
Electric	Single Family	Cool Room	Window Film	Window Film	No Film	Savings Per Building	Existing	28	10	\$1,159	50%	90%	\$6.84	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$289	95%	64%	\$5.12	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$289	95%	64%	\$5.12	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$383	95%	64%	\$6.25	0.00
Electric	Single Family	Cool Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$383	95%	64%	\$6.25	0.00
Electric	Single Family	Cool Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	40	40	\$4,681	25%	**%	\$10.17	0.00
Electric	Single Family	Cool Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	49	40	\$3,581	25%	**%	\$6.37	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$125	75%	99%	\$2.32	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$125	75%	99%	\$2.32	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$164	75%	99%	\$2.79	0.00
Electric	Single Family	Cool Room	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	6	20	\$164	75%	99%	\$2.79	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	9	40	\$194	100%	64%	\$1.79	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	9	40	\$194	100%	64%	\$1.79	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	11	40	\$194	100%	64%	\$1.47	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	11	40	\$194	100%	64%	\$1.47	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	5	40	\$52	100%	64%	\$0.81	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	5	40	\$52	100%	64%	\$0.81	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	6	40	\$52	100%	64%	\$0.66	0.00
Electric	Single Family	Cool Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	6	40	\$52	100%	64%	\$0.66	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	69	15	\$10,807	95%	N/A	\$20.21	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	69	15	\$10,807	95%	N/A	\$20.21	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	85	15	\$8,267	95%	N/A	\$12.67	0.00
Electric	Single Family	Cool Room	Ductless Air Conditioner (DAC)	Ductless Air Conditioner - SEER/EER 18/12.5	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	85	15	\$8,267	95%	N/A	\$12.67	0.00
Electric	Single Family	Cool Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	15	40	\$24,917	10%	***	\$140.69	0.00
Electric	Single Family	Cool Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	19	40	\$18,975	10%	***	\$87.77	0.00
Electric	Single Family	Cool Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	9	20	\$1,082	85%	95%	\$12.48	0.00
Electric	Single Family	Cool Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	11	20	\$827	85%	95%	\$7.82	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	29	9	\$41	100%	N/A	\$0.25	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR Room AC - CEER/EER 10.7/10.8 (8,000-13,999 Btuh)	Federal Standard 2001 Room AC - CEER/EER 9.7/9.8 (8,000-13,999 Btuh)	Per Installation	New	36	9	\$41	100%	N/A	\$0.21	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	19	40	\$355	75%	90%	\$1.63	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	19	40	\$355	75%	90%	\$1.63	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	21	40	\$321	75%	90%	\$1.33	0.00
Electric	Single Family	Cool Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	21	40	\$321	75%	90%	\$1.33	0.00
Electric	Single Family	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	11	11	\$172	95%	100%	\$2.49	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Cool Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	13	11	\$172	95%	100%	\$2.04	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	12	25	\$2,368	95%	44%	\$20.05	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	12	25	\$2,368	95%	44%	\$20.05	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	12	25	\$3,095	95%	44%	\$24.47	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	12	25	\$3,095	95%	44%	\$24.47	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	24	25	\$9,405	95%	99%	\$39.81	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	24	25	\$9,405	95%	99%	\$39.81	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	25	25	\$12,293	95%	99%	\$48.59	0.00
Electric	Single Family	Cool Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	25	25	\$12,293	95%	99%	\$48.59	0.00
Electric	Single Family	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	Existing	125	6	\$1.00	100%	N/A	\$0.00	491,394
Electric	Single Family	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	Existing	125	6	\$1.00	100%	N/A	\$0.00	530,973
Electric	Single Family	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	New	125	6	\$1.00	100%	N/A	\$0.00	107,192
Electric	Single Family	Copier	Office Copier - ENERGY STAR	ENERGY STAR Office Copier	Standard Office Copier	Per Installation	New	125	6	\$1.00	100%	N/A	\$0.00	109,353
Electric	Single Family	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	Existing	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Single Family	DVD	DVD Player - ENERGY STAR	ENERGY STAR DVD Player	Standard DVD Player	Per Installation	New	18	3	\$8	100%	N/A	\$0.21	0.00
Electric	Single Family	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	Existing	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Single Family	Dehumidifier	Dehumidifier - High Efficiency	High Efficiency Dehumidifier	Federal Standard 2013 Dehumidifier	Per Installation	New	77	12	\$44	100%	N/A	\$0.09	0.00
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	160	11	\$296	100%	N/A	\$0.29	0.00
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	160	11	\$296	100%	N/A	\$0.29	0.00
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	168	11	\$296	100%	N/A	\$0.28	0.00
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	168	11	\$296	100%	N/A	\$0.28	0.00
Electric	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	147	11	\$267	100%	N/A	\$0.29	0.00
Electric	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	Existing	155	11	\$267	100%	N/A	\$0.27	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	160	11	\$296	100%	N/A	\$0.29	47
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	160	11	\$296	100%	N/A	\$0.29	47
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	168	11	\$296	100%	N/A	\$0.28	4
Electric	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Steam Dryer with Controls - CEF/EF 3.79/3.9	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	168	11	\$296	100%	N/A	\$0.28	4
Electric	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	147	11	\$267	100%	N/A	\$0.29	-984,877164
Electric	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.73/3.83	Standard Dryer with Controls and Moisture Sensor - CEF/EF 3.14/3.19	Per Installation	New	155	11	\$267	100%	N/A	\$0.27	-823,279692
Electric	Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	46	12	\$6	100%	N/A	\$0.02	0.00
Electric	Single Family	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	Existing	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Single Family	Freezer	Freezer - Removal of Stand-Alone	Proper Disposal of Freezer	Existing Non-Efficient Freezer	Savings Per Building	Existing	916	5	\$30	53%	100%	\$0.01	31,903,370
Electric	Single Family	Freezer	Freezer - Removal of Stand-Alone	Proper Disposal of Freezer	Existing Non-Efficient Freezer	Savings Per Building	Existing	916	5	\$30	53%	100%	\$0.01	99,903,852
Electric	Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Installation	New	46	12	\$6	100%	N/A	\$0.02	0.00
Electric	Single Family	Freezer	Freezer - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Installation	New	128	12	\$3	100%	N/A	\$0.00	0.00
Electric	Single Family	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,150	18	\$1,585	13%	95%	\$0.16	0.00
Electric	Single Family	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,234	18	\$1,585	13%	95%	\$0.15	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,332	40	\$1,422	85%	64%	\$0.09	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,332	40	\$1,422	85%	64%	\$0.09	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,891	40	\$1,882	85%	64%	\$0.09	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,891	40	\$1,882	85%	64%	\$0.09	0.00
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	426	40	\$194	100%	64%	\$0.04	19,535,389
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	426	40	\$194	100%	64%	\$0.04	19,535,389
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	458	40	\$194	100%	64%	\$0.04	49,082,749
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	458	40	\$194	100%	64%	\$0.04	49,082,749
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	252	40	\$52	100%	64%	\$0.02	16,916,061
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	252	40	\$52	100%	64%	\$0.02	16,916,061
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	271	40	\$52	100%	64%	\$0.02	43,937,044
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	271	40	\$52	100%	64%	\$0.02	43,937,044

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,782	18	\$1,162	25%	64%	\$0.08	0.00
Electric	Single Family	Heat Central	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,913	18	\$1,162	25%	64%	\$0.07	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,808	40	\$1,014	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,808	40	\$1,014	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,568	40	\$1,342	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,568	40	\$1,342	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	249	11	\$320	75%	62%	\$0.20	0.00
Electric	Single Family	Heat Central	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	268	11	\$418	75%	62%	\$0.25	0.00
Electric	Single Family	Heat Central	Insulation Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	418	40	\$132	35%	64%	\$0.03	9,401,070
Electric	Single Family	Heat Central	Insulation Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	418	40	\$132	35%	64%	\$0.03	9,401,070
Electric	Single Family	Heat Central	Insulation Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	481	40	\$151	35%	64%	\$0.03	26,172,250
Electric	Single Family	Heat Central	Insulation Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	481	40	\$151	35%	64%	\$0.03	26,172,250
Electric	Single Family	Heat Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	335	11	\$33	100%	72%	\$0.02	24,829,269
Electric	Single Family	Heat Central	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	359	11	\$33	100%	72%	\$0.01	64,490,468
Electric	Single Family	Heat Central	Tune-up - Furnace (Electric)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	1,006	18	\$262	95%	75%	\$0.03	54,085,526
Electric	Single Family	Heat Central	Tune-up - Furnace (Electric)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	1,079	18	\$262	95%	75%	\$0.03	40,479,402
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	802	40	\$332	0.0%	95%	\$0.04	0.00
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	802	40	\$332	0.0%	95%	\$0.04	0.00
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	959	40	\$370	0.0%	95%	\$0.03	0.00
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	959	40	\$370	0.0%	95%	\$0.03	0.00
Electric	Single Family	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	4,394	40	\$1,881	75%	64%	\$0.04	93,016,025
Electric	Single Family	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	4,394	40	\$1,881	75%	64%	\$0.04	93,016,025
Electric	Single Family	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	5,253	40	\$2,096	75%	64%	\$0.04	58,051,825
Electric	Single Family	Heat Central	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	5,253	40	\$2,096	75%	64%	\$0.04	58,051,825
Electric	Single Family	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	335	11	\$172	95%	100%	\$0.08	0.00
Electric	Single Family	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	359	11	\$172	95%	100%	\$0.08	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,653	25	\$7,807	95%	44%	\$0.48	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,653	25	\$7,807	95%	44%	\$0.48	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,318	25	\$10,205	95%	44%	\$0.45	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,318	25	\$10,205	95%	44%	\$0.45	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	359	25	\$1,950	95%	44%	\$0.55	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	359	25	\$1,950	95%	44%	\$0.55	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	504	25	\$2,549	95%	44%	\$0.52	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	504	25	\$2,549	95%	44%	\$0.52	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,012	25	\$13,602	95%	99%	\$0.69	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,012	25	\$13,602	95%	99%	\$0.69	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,823	25	\$17,780	95%	99%	\$0.64	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	2,823	25	\$17,780	95%	99%	\$0.64	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	718	25	\$7,745	95%	99%	\$1.10	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	718	25	\$7,745	95%	99%	\$1.10	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	1,008	25	\$10,124	95%	99%	\$1.02	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	1,008	25	\$10,124	95%	99%	\$1.02	0.00
Electric	Single Family	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	993	18	\$1,585	45%	95%	\$0.19	0.00
Electric	Single Family	Heat Central	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	1,066	18	\$1,585	45%	95%	\$0.18	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	181	40	\$289	95%	64%	\$0.14	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	181	40	\$289	95%	64%	\$0.14	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	258	40	\$383	95%	64%	\$0.13	0.00
Electric	Single Family	Heat Central	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	258	40	\$383	95%	64%	\$0.13	0.00
Electric	Single Family	Heat Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	1,076	40	\$3,581	25%	***	\$0.30	0.00
Electric	Single Family	Heat Central	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	1,155	40	\$4,681	25%	***	\$0.36	0.00
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	426	40	\$194	100%	64%	\$0.04	3,215,547
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	426	40	\$194	100%	64%	\$0.04	3,215,547
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	458	40	\$194	100%	64%	\$0.04	7,832,439
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	458	40	\$194	100%	64%	\$0.04	7,832,439
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	252	40	\$52	100%	64%	\$0.02	2,070,497
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	252	40	\$52	100%	64%	\$0.02	2,070,497
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	271	40	\$52	100%	64%	\$0.02	5,079,952
Electric	Single Family	Heat Central	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	271	40	\$52	100%	64%	\$0.02	5,079,952

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	106	40	\$280	75%	64%	\$0.23	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	106	40	\$280	75%	64%	\$0.23	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	151	40	\$371	75%	64%	\$0.22	0.00
Electric	Single Family	Heat Central	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	151	40	\$371	75%	64%	\$0.22	0.00
Electric	Single Family	Heat Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	414	40	\$18,975	10%	**%	\$4.07	0.00
Electric	Single Family	Heat Central	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	444	40	\$24,917	10%	**%	\$4.98	0.00
Electric	Single Family	Heat Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	731	20	\$827	85%	95%	\$0.13	0.00
Electric	Single Family	Heat Central	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	784	20	\$1,082	85%	95%	\$0.15	0.00
Electric	Single Family	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	858	40	\$474	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	858	40	\$474	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	1,135	40	\$628	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Central	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	1,135	40	\$628	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	774	40	\$321	75%	90%	\$0.04	6,603,926
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	774	40	\$321	75%	90%	\$0.04	6,603,926
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	920	40	\$355	75%	90%	\$0.03	17,936,704
Electric	Single Family	Heat Central	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	920	40	\$355	75%	90%	\$0.03	17,936,704
Electric	Single Family	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	289	11	\$172	95%	100%	\$0.09	0.00
Electric	Single Family	Heat Central	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	311	11	\$172	95%	100%	\$0.09	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	436	25	\$2,368	95%	44%	\$0.55	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	436	25	\$2,368	95%	44%	\$0.55	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	612	25	\$3,095	95%	44%	\$0.52	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	612	25	\$3,095	95%	44%	\$0.52	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	872	25	\$9,405	95%	99%	\$1.10	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	872	25	\$9,405	95%	99%	\$1.10	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	1,224	25	\$12,293	95%	99%	\$1.02	0.00
Electric	Single Family	Heat Central	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	1,224	25	\$12,293	95%	99%	\$1.02	0.00
Electric	Single Family	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,197	18	\$1,585	13%	95%	\$0.16	0.00
Electric	Single Family	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	1,202	18	\$1,585	13%	95%	\$0.16	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	775	40	\$1,422	85%	64%	\$0.16	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	775	40	\$1,422	85%	64%	\$0.16	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,052	40	\$1,882	85%	64%	\$0.16	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	1,052	40	\$1,882	85%	64%	\$0.16	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	15	20	\$125	75%	99%	\$0.89	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	15	20	\$125	75%	99%	\$0.89	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	62	20	\$164	75%	99%	\$0.30	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	Existing	62	20	\$164	75%	99%	\$0.30	0.00
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	248	40	\$194	100%	64%	\$0.07	23,994,776
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	248	40	\$194	100%	64%	\$0.07	23,994,776
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	254	40	\$194	100%	64%	\$0.07	66,473,947
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	254	40	\$194	100%	64%	\$0.07	66,473,947
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	147	40	\$52	100%	64%	\$0.03	17,543,463
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	147	40	\$52	100%	64%	\$0.03	17,543,463
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	150	40	\$52	100%	64%	\$0.03	49,626,704
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	150	40	\$52	100%	64%	\$0.03	49,626,704
Electric	Single Family	Heat Pump	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,954	18	\$1,162	25%	64%	\$0.07	25,426,106
Electric	Single Family	Heat Pump	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	1,961	18	\$1,162	25%	64%	\$0.07	46,650,428
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	857	40	\$1,014	25%	64%	\$0.11	19,776,943
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	857	40	\$1,014	25%	64%	\$0.11	19,776,943
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,217	40	\$1,342	25%	64%	\$0.10	75,790,269
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,217	40	\$1,342	25%	64%	\$0.10	75,790,269
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,060	15	\$1,415	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,060	15	\$1,415	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,082	15	\$1,415	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,082	15	\$1,415	100%	N/A	\$0.17	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	728	15	\$1,061	100%	N/A	\$0.19	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	728	15	\$1,061	100%	N/A	\$0.19	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	752	15	\$1,061	100%	N/A	\$0.18	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	752	15	\$1,061	100%	N/A	\$0.18	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,157	15	\$3,538	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,157	15	\$3,538	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,206	15	\$3,538	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	2,206	15	\$3,538	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	650	15	\$707	100%	N/A	\$0.14	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	650	15	\$707	100%	N/A	\$0.14	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	656	15	\$707	100%	N/A	\$0.14	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	656	15	\$707	100%	N/A	\$0.14	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,585	15	\$2,123	100%	N/A	\$0.18	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,585	15	\$2,123	100%	N/A	\$0.18	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,609	15	\$2,123	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	1,609	15	\$2,123	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	3,779	15	\$9,018	25%	N/A	\$0.31	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	3,779	15	\$9,018	25%	N/A	\$0.31	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	3,786	15	\$9,018	25%	N/A	\$0.31	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	Existing	3,786	15	\$9,018	25%	N/A	\$0.31	0.00
Electric	Single Family	Heat Pump	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	202	11	\$418	75%	62%	\$0.33	0.00
Electric	Single Family	Heat Pump	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	203	11	\$320	75%	62%	\$0.25	0.00
Electric	Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	198	40	\$132	35%	64%	\$0.06	7,609,030
Electric	Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	198	40	\$132	35%	64%	\$0.06	7,609,030
Electric	Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	228	40	\$151	35%	64%	\$0.06	24,113,163
Electric	Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	228	40	\$151	35%	64%	\$0.06	24,113,163
Electric	Single Family	Heat Pump	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	367	11	\$33	100%	72%	\$0.01	39,519,521
Electric	Single Family	Heat Pump	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	369	11	\$33	100%	72%	\$0.01	50,797,168
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	1,204	15	\$412	95%	65%	\$0.04	4,955,689
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	1,204	15	\$412	95%	65%	\$0.04	4,955,689

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	1,207	15	\$412	95%	65%	\$0.04	89,990,519
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	Existing	1,207	15	\$412	95%	65%	\$0.04	89,990,519
Electric	Single Family	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	371	5	\$300	20%	75%	\$0.24	0.00
Electric	Single Family	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	371	5	\$300	20%	75%	\$0.24	0.00
Electric	Single Family	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	402	5	\$300	20%	75%	\$0.22	0.00
Electric	Single Family	Heat Pump	Tune-up - Heat Pump	Heat Pump with Tune-up	Heat Pump with no Tune-up	Savings Per Building	Existing	402	5	\$300	20%	75%	\$0.22	0.00
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	467	40	\$332	0.0%	95%	\$0.06	0.00
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	467	40	\$332	0.0%	95%	\$0.06	0.00
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	533	40	\$370	0.0%	95%	\$0.06	0.00
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	533	40	\$370	0.0%	95%	\$0.06	0.00
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	2,557	40	\$1,881	75%	64%	\$0.07	9,435,959
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	2,557	40	\$1,881	75%	64%	\$0.07	9,435,959
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	2,923	40	\$2,096	75%	64%	\$0.06	59,054,970
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	2,923	40	\$2,096	75%	64%	\$0.06	59,054,970
Electric	Single Family	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	315	20	\$455	50%	95%	\$0.16	0.00
Electric	Single Family	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	Existing	316	20	\$455	50%	95%	\$0.16	0.00
Electric	Single Family	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	367	11	\$172	95%	100%	\$0.07	0.00
Electric	Single Family	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	369	11	\$172	95%	100%	\$0.07	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	962	25	\$7,807	95%	44%	\$0.83	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	962	25	\$7,807	95%	44%	\$0.83	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,290	25	\$10,205	95%	44%	\$0.81	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,290	25	\$10,205	95%	44%	\$0.81	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	209	25	\$1,950	95%	44%	\$0.95	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	209	25	\$1,950	95%	44%	\$0.95	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	280	25	\$2,549	95%	44%	\$0.93	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	280	25	\$2,549	95%	44%	\$0.93	0.00

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,171	25	\$13,602	95%	99%	\$1.18	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,171	25	\$13,602	95%	99%	\$1.18	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,570	25	\$17,780	95%	99%	\$1.15	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	1,570	25	\$17,780	95%	99%	\$1.15	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	418	25	\$7,745	95%	99%	\$1.89	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	418	25	\$7,745	95%	99%	\$1.89	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	560	25	\$10,124	95%	99%	\$1.84	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	560	25	\$10,124	95%	99%	\$1.84	0.00
Electric	Single Family	Heat Pump	Window Film	Window Film	No Film	Savings Per Building	Existing	788	10	\$1,515	50%	90%	\$0.33	0.00
Electric	Single Family	Heat Pump	Window Film	Window Film	No Film	Savings Per Building	Existing	791	10	\$1,159	50%	90%	\$0.25	0.00
Electric	Single Family	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	974	18	\$1,585	45%	95%	\$0.19	0.00
Electric	Single Family	Heat Pump	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	995	18	\$1,585	45%	95%	\$0.19	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	89	40	\$289	95%	64%	\$0.29	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	89	40	\$289	95%	64%	\$0.29	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	122	40	\$383	95%	64%	\$0.28	0.00
Electric	Single Family	Heat Pump	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	122	40	\$383	95%	64%	\$0.28	0.00
Electric	Single Family	Heat Pump	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	1,111	40	\$3,581	25%	***	\$0.29	0.00
Electric	Single Family	Heat Pump	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	1,135	40	\$4,681	25%	***	\$0.37	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	12	20	\$125	75%	99%	\$1.10	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	12	20	\$125	75%	99%	\$1.10	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	51	20	\$164	75%	99%	\$0.36	0.00
Electric	Single Family	Heat Pump	Cool Roof	Lighter Colored Shingles (White)	Standard Roof Shingles	Savings Per Building	New	51	20	\$164	75%	99%	\$0.36	0.00
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	210	40	\$194	100%	64%	\$0.08	2,964,211
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	210	40	\$194	100%	64%	\$0.08	2,964,211
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	217	40	\$194	100%	64%	\$0.08	7,837,419
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	217	40	\$194	100%	64%	\$0.08	7,837,419
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	124	40	\$52	100%	64%	\$0.04	1,966,305
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	124	40	\$52	100%	64%	\$0.04	1,966,305
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	128	40	\$52	100%	64%	\$0.04	5,220,841

Table F.1. Residential Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	128	40	\$52	100%	64%	\$0.04	5,220,841
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	44	40	\$280	75%	64%	\$0.56	0.00
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	44	40	\$280	75%	64%	\$0.56	0.00
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	63	40	\$371	75%	64%	\$0.52	0.00
Electric	Single Family	Heat Pump	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	63	40	\$371	75%	64%	\$0.52	0.00
Electric	Single Family	Heat Pump	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	427	40	\$18,975	10%	**%	\$3.94	0.00
Electric	Single Family	Heat Pump	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	436	40	\$24,917	10%	**%	\$5.07	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	888	15	\$1,415	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	888	15	\$1,415	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	893	15	\$1,415	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source CEE Tier 2	CEE Tier 2 Air Source Heat Pump - SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	893	15	\$1,415	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	603	15	\$1,061	100%	N/A	\$0.23	73
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	603	15	\$1,061	100%	N/A	\$0.23	73
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	605	15	\$1,061	100%	N/A	\$0.23	9
Electric	Single Family	Heat Pump	Heat Pump - Air Source ENERGY STAR	ENERGY STAR Air Source Heat Pump - SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	605	15	\$1,061	100%	N/A	\$0.23	9
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,805	15	\$3,538	100%	N/A	\$0.26	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,805	15	\$3,538	100%	N/A	\$0.26	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,811	15	\$3,538	100%	N/A	\$0.26	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Enhanced	Enhanced Air Source Heat Pump - SEER/EER 18/14 and HSPF 9.5 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,811	15	\$3,538	100%	N/A	\$0.26	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	548	15	\$707	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	548	15	\$707	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	556	15	\$707	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Federal Standard 2015	Federal Standard 2015 Air Source Heat Pump - SEER/EER 14/12 and HSPF 8.2 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	556	15	\$707	100%	N/A	\$0.17	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,332	15	\$2,123	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,332	15	\$2,123	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,345	15	\$2,123	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Air Source Premium	Premium Air Source Heat Pump - SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	1,345	15	\$2,123	100%	N/A	\$0.21	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	3,217	15	\$9,160	50%	N/A	\$0.37	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	3,217	15	\$9,160	50%	N/A	\$0.37	0.00
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	3,291	15	\$9,160	50%	N/A	\$0.36	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Heat Pump - Ground Source	ENERGY STAR Ground Source Heat Pump - EER 17.1 and 3.6 COP (Split System)	Federal Standard 2006 Air Source Heat Pump - SEER/EER 13/11 and HSPF 7.7 (Split System)	Per Installation	New	3,291	15	\$9,160	50%	N/A	\$0.36	0.00
Electric	Single Family	Heat Pump	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	485	20	\$827	85%	95%	\$0.19	0.00
Electric	Single Family	Heat Pump	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	495	20	\$1,082	85%	95%	\$0.25	0.00
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	985	15	\$412	95%	65%	\$0.05	12,522,747
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	985	15	\$412	95%	65%	\$0.05	12,522,747
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	1,011	15	\$412	95%	65%	\$0.05	33,553,461
Electric	Single Family	Heat Pump	Quality Installation - Heat Pump	Quality Installation of Heat Pump - Commissioning, Controls, and Proper Sizing	Standard Installation of Heat Pump	Savings Per Building	New	1,011	15	\$412	95%	65%	\$0.05	33,553,461
Electric	Single Family	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	357	40	\$474	20%	75%	\$0.12	0.00
Electric	Single Family	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	357	40	\$474	20%	75%	\$0.12	0.00
Electric	Single Family	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	472	40	\$628	20%	75%	\$0.12	3,815,931
Electric	Single Family	Heat Pump	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	472	40	\$628	20%	75%	\$0.12	3,815,931
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	382	40	\$321	75%	90%	\$0.07	5,880,887
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	382	40	\$321	75%	90%	\$0.07	5,880,887
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	437	40	\$355	75%	90%	\$0.07	17,277,604
Electric	Single Family	Heat Pump	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	437	40	\$355	75%	90%	\$0.07	17,277,604
Electric	Single Family	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	256	20	\$455	50%	95%	\$0.20	0.00
Electric	Single Family	Heat Pump	Whole-House Fan	Whole-House Fan	No Whole-House Fan	Savings Per Building	New	261	20	\$455	50%	95%	\$0.20	0.00
Electric	Single Family	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	299	11	\$172	95%	100%	\$0.09	5,939,086
Electric	Single Family	Heat Pump	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	305	11	\$172	95%	100%	\$0.09	15,762,424
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	215	25	\$2,368	95%	44%	\$1.12	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	215	25	\$2,368	95%	44%	\$1.12	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	290	25	\$3,095	95%	44%	\$1.08	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	290	25	\$3,095	95%	44%	\$1.08	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	430	25	\$9,405	95%	99%	\$2.23	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	430	25	\$9,405	95%	99%	\$2.23	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	581	25	\$12,293	95%	99%	\$2.15	0.00
Electric	Single Family	Heat Pump	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	581	25	\$12,293	95%	99%	\$2.15	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	333	40	\$1,422	85%	64%	\$0.38	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	333	40	\$1,422	85%	64%	\$0.38	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	472	40	\$1,882	85%	64%	\$0.35	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	472	40	\$1,882	85%	64%	\$0.35	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	106	40	\$194	100%	64%	\$0.16	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	106	40	\$194	100%	64%	\$0.16	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	114	40	\$194	100%	64%	\$0.15	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	114	40	\$194	100%	64%	\$0.15	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	63	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	63	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	67	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	67	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	4,863	15	\$6,573	50%	N/A	\$0.17	0.00
Electric	Single Family	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	Existing	5,219	15	\$8,592	50%	N/A	\$0.20	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,808	40	\$1,014	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	1,808	40	\$1,014	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,568	40	\$1,342	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	2,568	40	\$1,342	25%	64%	\$0.05	0.00
Electric	Single Family	Heat Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	189	11	\$320	75%	62%	\$0.27	0.00
Electric	Single Family	Heat Room	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	203	11	\$418	75%	62%	\$0.33	0.00
Electric	Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	418	40	\$132	35%	64%	\$0.03	300,901
Electric	Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	418	40	\$132	35%	64%	\$0.03	300,901

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	481	40	\$151	35%	64%	\$0.03	3,276,550
Electric	Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	481	40	\$151	35%	64%	\$0.03	3,276,550
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	200	40	\$332	0.0%	95%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	200	40	\$332	0.0%	95%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	239	40	\$370	0.0%	95%	\$0.14	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	239	40	\$370	0.0%	95%	\$0.14	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,098	40	\$1,881	75%	64%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,098	40	\$1,881	75%	64%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,313	40	\$2,096	75%	64%	\$0.14	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	1,313	40	\$2,096	75%	64%	\$0.14	0.00
Electric	Single Family	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	254	11	\$172	95%	100%	\$0.11	0.00
Electric	Single Family	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	273	11	\$172	95%	100%	\$0.10	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	413	25	\$7,807	95%	44%	\$1.92	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	413	25	\$7,807	95%	44%	\$1.92	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	579	25	\$10,205	95%	44%	\$1.79	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	579	25	\$10,205	95%	44%	\$1.79	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	89	25	\$1,950	95%	44%	\$2.21	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	89	25	\$1,950	95%	44%	\$2.21	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	126	25	\$2,549	95%	44%	\$2.06	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	126	25	\$2,549	95%	44%	\$2.06	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	503	25	\$13,602	95%	99%	\$2.75	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	503	25	\$13,602	95%	99%	\$2.75	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	705	25	\$17,780	95%	99%	\$2.57	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	705	25	\$17,780	95%	99%	\$2.57	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	179	25	\$7,745	95%	99%	\$4.39	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	179	25	\$7,745	95%	99%	\$4.39	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	252	25	\$10,124	95%	99%	\$4.09	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	Existing	252	25	\$10,124	95%	99%	\$4.09	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	45	40	\$289	95%	64%	\$0.57	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	45	40	\$289	95%	64%	\$0.57	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	64	40	\$383	95%	64%	\$0.53	0.00
Electric	Single Family	Heat Room	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	64	40	\$383	95%	64%	\$0.53	0.00
Electric	Single Family	Heat Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	818	40	\$3,581	25%	**%	\$0.39	0.00
Electric	Single Family	Heat Room	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	877	40	\$4,681	25%	**%	\$0.47	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	106	40	\$194	100%	64%	\$0.16	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	114	40	\$194	100%	64%	\$0.15	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	63	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	63	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	67	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	67	40	\$52	100%	64%	\$0.07	0.00
Electric	Single Family	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	New	4,202	15	\$6,573	95%	N/A	\$0.20	0.00
Electric	Single Family	Heat Room	Ductless Heat Pump (DHP)	Ductless Heat Pump - SEER/EER 18/12.5, HSPF 10.0	Standard Baseboard Heating - HSPF 3.41	Per Installation	New	4,509	15	\$8,592	95%	N/A	\$0.25	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	106	40	\$280	75%	64%	\$0.23	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	106	40	\$280	75%	64%	\$0.23	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	151	40	\$371	75%	64%	\$0.22	0.00
Electric	Single Family	Heat Room	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	151	40	\$371	75%	64%	\$0.22	0.00
Electric	Single Family	Heat Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	314	40	\$18,975	10%	**%	\$5.35	0.00
Electric	Single Family	Heat Room	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	337	40	\$24,917	10%	**%	\$6.55	0.00
Electric	Single Family	Heat Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	571	20	\$827	85%	95%	\$0.16	0.00
Electric	Single Family	Heat Room	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	613	20	\$1,082	85%	95%	\$0.20	0.00
Electric	Single Family	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	858	40	\$474	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	858	40	\$474	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	1,135	40	\$628	20%	75%	\$0.05	0.00
Electric	Single Family	Heat Room	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	1,135	40	\$628	20%	75%	\$0.05	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	193	40	\$321	75%	90%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	193	40	\$321	75%	90%	\$0.15	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	230	40	\$355	75%	90%	\$0.14	0.00
Electric	Single Family	Heat Room	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	230	40	\$355	75%	90%	\$0.14	0.00
Electric	Single Family	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	220	11	\$172	95%	100%	\$0.12	0.00
Electric	Single Family	Heat Room	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	236	11	\$172	95%	100%	\$0.12	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	109	25	\$2,368	95%	44%	\$2.21	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	109	25	\$2,368	95%	44%	\$2.21	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	153	25	\$3,095	95%	44%	\$2.06	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	153	25	\$3,095	95%	44%	\$2.06	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	218	25	\$9,405	95%	99%	\$4.39	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	218	25	\$9,405	95%	99%	\$4.39	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	306	25	\$12,293	95%	99%	\$4.09	0.00
Electric	Single Family	Heat Room	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	306	25	\$12,293	95%	99%	\$4.09	0.00
Electric	Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	Existing	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Homes Audio System	Standard Homes Audio System	Per Installation	New	22	7	\$106	100%	N/A	\$1.08	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	7	\$1	50%	N/A	-\$0.04	88,956,456
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	25	7	\$1	50%	N/A	-\$0.04	88,956,456
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	26	7	\$1	50%	N/A	-\$0.04	81,353,707
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	Existing	26	7	\$1	50%	N/A	-\$0.04	81,353,707
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	29	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	Existing	29	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	25	7	\$1	50%	N/A	-\$0.04	28,654,917
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	25	7	\$1	50%	N/A	-\$0.04	28,654,917

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	26	7	\$1	50%	N/A	-\$0.04	29,147,058
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - High Efficiency CFL	High Efficiency Specialty Lamp -CFL	Standard Specialty Lamp - Incandescent	Per Installation	New	26	7	\$1	50%	N/A	-\$0.04	29,147,058
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	28	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	29	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Interior Specialty	Lighting Specialty Lamp - Premium Efficiency LED	Premium Efficiency Specialty Lamp -LED	Standard Specialty Lamp - Incandescent	Per Installation	New	29	12	\$37	85%	N/A	\$0.15	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	11	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	11	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	12	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	12	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	5	\$1	100%	N/A	-\$0.00	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	Existing	31	5	\$1	100%	N/A	-\$0.00	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	34	12	\$21	100%	N/A	\$0.08	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	34	12	\$21	100%	N/A	\$0.08	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	35	12	\$21	100%	N/A	\$0.07	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	Existing	35	12	\$21	100%	N/A	\$0.07	0.00
Electric	Single Family	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	Existing	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Single Family	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	Existing	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Single Family	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	Existing	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	Existing	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	Existing	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	Existing	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	11	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	11	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	12	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2014	EISA Standard 2014 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	12	2	\$0.91	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	31	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - EISA Standard 2020	EISA Standard 2020 General Service Lamp - Incandescent	Standard General Service Lamp - Incandescent	Per Installation	New	31	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	30	5	\$1	100%	N/A	-\$0.01	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	31	5	\$1	100%	N/A	-\$0.00	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - High Efficiency CFL	High Efficiency General Service Lamp -CFL	Standard General Service Lamp - Incandescent	Per Installation	New	31	5	\$1	100%	N/A	-\$0.00	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	34	12	\$21	100%	N/A	\$0.08	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	34	12	\$21	100%	N/A	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	35	12	\$21	100%	N/A	\$0.07	0.00
Electric	Single Family	Lighting Standard	Lighting General Service Lamp - Premium Efficiency LED	Premium Efficiency General Service Lamp -LED	Standard General Service Lamp - Incandescent	Per Installation	New	35	12	\$21	100%	N/A	\$0.07	0.00
Electric	Single Family	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	New	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Single Family	Lighting Standard	Occupancy Sensor - Interior Lighting	Install Wall-Switch Occupancy Sensor on Interior Lighting	Manual Control on Interior Lighting	Savings Per Building	New	6	10	\$60	2.5%	95%	\$1.67	0.00
Electric	Single Family	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	New	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Photocell Daylighting Control - Interior/ Exterior Lighting	Install Photocell on Interior/Exterior Lighting	Manual Control on Interior/Exterior Lighting	Savings Per Building	New	4	10	\$68	10%	80%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	New	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Single Family	Lighting Standard	Time Clock - Exterior Lighting	Time Clock on Exterior Lighting	Manual Control on Exterior Lighting	Savings Per Building	New	4	10	\$68	2.3%	70%	\$2.82	0.00
Electric	Single Family	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	Existing	14	5	\$1.00	100%	N/A	\$0.02	1,839,490
Electric	Single Family	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	Existing	14	5	\$1.00	100%	N/A	\$0.02	1,877,208
Electric	Single Family	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	New	14	5	\$1.00	100%	N/A	\$0.02	461,601
Electric	Single Family	Monitor	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Installation	New	14	5	\$1.00	100%	N/A	\$0.02	479,099
Electric	Single Family	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	Existing	149	6	\$1.00	100%	N/A	\$0.00	10,999,488
Electric	Single Family	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	Existing	149	6	\$1.00	100%	N/A	\$0.00	11,885,424
Electric	Single Family	Multifunction Device	Office Multifunction Device - ENERGY STAR	ENERGY STAR Multifunction Device "All-In-One" Imaging Equipment	Standard Multifunction Device "All-In-One" Imaging Equipment	Per Installation	New	149	6	\$1.00	100%	N/A	\$0.00	0.00
Electric	Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	Existing	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Savings Per Building	New	43	4	\$22	20%	85%	\$0.18	0.00
Electric	Single Family	Pool Pump	Pool Pump - 2 Speed	2 Speed Pool Pump	Standard 1 Speed Pool Pump	Per Installation	Existing	440	10	\$175	75%	N/A	\$0.07	0.00
Electric	Single Family	Pool Pump	Pool Pump - VSD	Pool Pump with Variable Speed Drive (VSD)	Standard 1 Speed Pool Pump	Per Installation	Existing	1,170	10	\$750	100%	N/A	\$0.11	0.00
Electric	Single Family	Pool Pump	Pool Pump Timer	Pool Pump Timer	No Timer	Savings Per Building	Existing	803	10	\$82	6.3%	90%	\$0.02	4,483,636
Electric	Single Family	Pool Pump	Pool Pump Timer	Pool Pump Timer	No Timer	Savings Per Building	Existing	803	10	\$82	6.3%	90%	\$0.02	5,421,208
Electric	Single Family	Pool Pump	Pool Pump Timer	Pool Pump Timer	No Timer	Savings Per Building	Existing	803	10	\$82	7.3%	90%	\$0.02	4,483,636
Electric	Single Family	Pool Pump	Pool Pump Timer	Pool Pump Timer	No Timer	Savings Per Building	Existing	803	10	\$82	7.3%	90%	\$0.02	5,421,208
Electric	Single Family	Pool Pump	Pool Pump - 2 Speed	2 Speed Pool Pump	Standard 1 Speed Pool Pump	Per Installation	New	440	10	\$175	75%	N/A	\$0.07	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Pool Pump	Pool Pump - VSD	Pool Pump with Variable Speed Drive (VSD)	Standard 1 Speed Pool Pump	Per Installation	New	1,170	10	\$750	100%	N/A	\$0.11	0.00
Electric	Single Family	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	Existing	91	5	\$1.00	100%	N/A	\$0.00	0.00
Electric	Single Family	Printer	Office Printer - ENERGY STAR	ENERGY STAR Office Printer	Standard Office Printer	Per Installation	New	91	5	\$1.00	100%	N/A	\$0.00	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	140	12	\$472	100%	N/A	\$0.51	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	140	12	\$472	100%	N/A	\$0.51	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	145	12	\$472	100%	N/A	\$0.49	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	145	12	\$472	100%	N/A	\$0.49	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	168	12	\$633	100%	N/A	\$0.57	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	168	12	\$633	100%	N/A	\$0.57	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	174	12	\$633	100%	N/A	\$0.54	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	174	12	\$633	100%	N/A	\$0.54	0.00
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	112	12	\$37	100%	N/A	\$0.05	34,820,595
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	112	12	\$37	100%	N/A	\$0.05	34,820,595
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	116	12	\$37	100%	N/A	\$0.05	35,320,296
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	116	12	\$37	100%	N/A	\$0.05	35,320,296
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	57	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	Existing	57	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Removal of Secondary	Proper Disposal of Refrigerator	Existing Non-Efficient Refrigerator	Savings Per Building	Existing	1,140	5	\$30	32%	100%	\$0.01	60,967,249
Electric	Single Family	Refrigerator	Refrigerator - Removal of Secondary	Proper Disposal of Refrigerator	Existing Non-Efficient Refrigerator	Savings Per Building	Existing	1,140	5	\$30	32%	100%	\$0.01	66,342,570
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	140	12	\$472	100%	N/A	\$0.51	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	140	12	\$472	100%	N/A	\$0.51	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	145	12	\$472	100%	N/A	\$0.49	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	145	12	\$472	100%	N/A	\$0.49	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	168	12	\$633	100%	N/A	\$0.57	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	168	12	\$633	100%	N/A	\$0.57	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	174	12	\$633	100%	N/A	\$0.54	0.00
Electric	Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	174	12	\$633	100%	N/A	\$0.54	0.00
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	112	12	\$37	100%	N/A	\$0.05	7,449,876

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	112	12	\$37	100%	N/A	\$0.05	7,449,876
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	116	12	\$37	100%	N/A	\$0.05	8,114,403
Electric	Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	116	12	\$37	100%	N/A	\$0.05	8,114,403
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	55	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	57	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Installation	New	57	12	\$22	100%	N/A	\$0.06	0.00
Electric	Single Family	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	Existing	201	5	\$6	100%	N/A	\$0.01	16,200,459
Electric	Single Family	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	Existing	201	5	\$6	100%	N/A	\$0.01	99,782,693
Electric	Single Family	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	New	201	5	\$6	100%	N/A	\$0.01	10,464,404
Electric	Single Family	Set Top Box	Set Top Box - ENERGY STAR	ENERGY STAR Set Top Box	Standard Set Top Box	Per Installation	New	201	5	\$6	100%	N/A	\$0.01	11,505,190
Electric	Single Family	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	Existing	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Single Family	TV	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Installation	New	130	5	\$42	100%	N/A	\$0.09	0.00
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	357	20	\$120	100%	N/A	\$0.04	71,251,439
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	357	20	\$120	100%	N/A	\$0.04	71,251,439
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	394	20	\$120	100%	N/A	\$0.03	33,825,163
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	Existing	394	20	\$120	100%	N/A	\$0.03	33,825,163
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	357	20	\$120	100%	N/A	\$0.04	37,846,580
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	357	20	\$120	100%	N/A	\$0.04	37,846,580
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	394	10	\$120	100%	N/A	\$0.05	0.00
Electric	Single Family	Ventilation and Circulation	Motor - ECM	Electronically Commutated Motor (ECM)	Standard Motor	Per Installation	New	394	10	\$120	100%	N/A	\$0.05	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	2,327	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	2,327	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	2,395	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	2,395	13	\$1,684	75%	N/A	\$0.11	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	52	13	\$1,003	75%	N/A	\$3.25	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	52	13	\$1,003	75%	N/A	\$3.25	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	92	13	\$1,003	75%	N/A	\$1.83	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	Existing	92	13	\$1,003	75%	N/A	\$1.83	0.00
Electric	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,309	20	\$5,517	20%	N/A	\$0.29	0.00
Electric	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,337	20	\$5,517	20%	N/A	\$0.28	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	2,327	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	2,327	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	2,395	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Enhanced Efficiency	Enhanced Efficiency Heat Pump Water Heater > 55 GAL - EF 2.2	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	2,395	13	\$1,684	75%	N/A	\$0.11	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	52	13	\$1,003	75%	N/A	\$3.25	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	52	13	\$1,003	75%	N/A	\$3.25	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	92	13	\$1,003	75%	N/A	\$1.83	0.00
Electric	Single Family	Water Heat GT 55 Gal	Heat Pump Water Heater - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater > 55 GAL - EF 1.97	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.87	Per Installation	New	92	13	\$1,003	75%	N/A	\$1.83	0.00
Electric	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,309	20	\$5,517	20%	N/A	\$0.29	0.00
Electric	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,337	20	\$5,517	20%	N/A	\$0.28	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	307	11	\$198	99%	33%	\$0.10	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	56	11	\$161	71%	30%	\$0.45	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	47	11	\$154	71%	30%	\$0.51	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	453	40	\$935	30%	***%	\$0.18	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	458	40	\$935	30%	***%	\$0.18	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	137	10	\$5	100%	25%	\$0.01	4,015,049
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	137	10	\$5	100%	25%	\$0.01	4,015,049
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	143	10	\$5	100%	25%	\$0.01	11,898,194
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	143	10	\$5	100%	25%	\$0.01	11,898,194
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	120	10	\$2	75%	65%	\$0.00	6,850,677
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	120	10	\$2	75%	65%	\$0.00	6,850,677
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	125	10	\$2	75%	65%	\$0.00	20,301,294
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	125	10	\$2	75%	65%	\$0.00	20,301,294
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	293	10	\$8	75%	95%	\$0.01	24,316,140
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	293	10	\$8	75%	95%	\$0.01	24,316,140
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	305	10	\$8	75%	95%	\$0.00	72,058,440
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	305	10	\$8	75%	95%	\$0.00	72,058,440
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	427	10	\$15	100%	65%	\$0.01	91,774,409
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	427	10	\$15	100%	65%	\$0.01	91,774,409
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	432	10	\$15	100%	65%	\$0.01	32,711,452
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	432	10	\$15	100%	65%	\$0.01	32,711,452
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	427	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	427	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	432	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	432	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	1,471,677

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	4,153,724
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	1,471,677
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	4,153,724
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	435	11	\$210	99%	33%	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	56	11	\$155	71%	30%	\$0.44	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	451	40	\$935	60%	***	\$0.18	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	456	40	\$935	60%	***	\$0.18	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	120	10	\$2	75%	65%	\$0.00	1,022,756
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	120	10	\$2	75%	65%	\$0.00	1,022,756
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	125	10	\$2	75%	65%	\$0.00	2,865,892
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	125	10	\$2	75%	65%	\$0.00	2,865,892
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	293	10	\$8	75%	95%	\$0.01	3,630,225
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	293	10	\$8	75%	95%	\$0.01	3,630,225
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	305	10	\$8	75%	95%	\$0.00	10,172,343
Electric	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	305	10	\$8	75%	95%	\$0.00	10,172,343
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	427	10	\$15	100%	65%	\$0.01	12,955,607
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	427	10	\$15	100%	65%	\$0.01	12,955,607
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	432	10	\$15	100%	65%	\$0.01	4,883,584
Electric	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	432	10	\$15	100%	65%	\$0.01	4,883,584
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,972	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	1,972	13	\$1,123	75%	N/A	\$0.09	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,035	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,035	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,309	20	\$5,517	20%	N/A	\$0.29	0.00
Electric	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	2,337	20	\$5,517	20%	N/A	\$0.28	0.00
Electric	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	117	13	\$72	100%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	Existing	118	13	\$72	100%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,972	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	1,972	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,035	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Heat Pump Water Heater - ENERGY STAR	ENERGY STAR Heat Pump Water Heater = 55 GAL - EF 2.0	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,035	13	\$1,123	75%	N/A	\$0.09	0.00
Electric	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,309	20	\$5,517	20%	N/A	\$0.29	0.00
Electric	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	2,337	20	\$5,517	20%	N/A	\$0.28	0.00
Electric	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	117	13	\$72	100%	N/A	\$0.09	-1096.286844
Electric	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.95	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.92	Per Installation	New	118	13	\$72	100%	N/A	\$0.09	-1527.823716
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	236	11	\$140	99%	33%	\$0.09	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	324	11	\$198	99%	33%	\$0.10	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	328	11	\$152	99%	33%	\$0.07	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	59	11	\$161	71%	30%	\$0.43	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	453	40	\$935	30%	**%	\$0.18	0.00
Electric	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	458	40	\$935	30%	**%	\$0.18	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	137	10	\$5	100%	25%	\$0.01	5,850,558
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	137	10	\$5	100%	25%	\$0.01	5,850,558
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	143	10	\$5	100%	25%	\$0.01	18,928,535
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	143	10	\$5	100%	25%	\$0.01	18,928,535
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	120	10	\$2	75%	65%	\$0.00	9,982,515
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	120	10	\$2	75%	65%	\$0.00	9,982,515
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	125	10	\$2	75%	65%	\$0.00	32,296,814
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	125	10	\$2	75%	65%	\$0.00	32,296,814
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	293	10	\$8	75%	95%	\$0.01	35,432,445
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	293	10	\$8	75%	95%	\$0.01	35,432,445
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	305	10	\$8	75%	95%	\$0.00	14,635,944
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	305	10	\$8	75%	95%	\$0.00	14,635,944
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	427	10	\$15	100%	65%	\$0.01	46,001,579
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	427	10	\$15	100%	65%	\$0.01	46,001,579
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	432	10	\$15	100%	65%	\$0.01	47,665,737
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	432	10	\$15	100%	65%	\$0.01	47,665,737
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	427	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	427	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	432	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	432	10	\$44	100%	10%	\$0.02	0.00
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	2,144,466
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	6,608,054
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	2,144,466
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	53	15	\$3	95%	30%	\$0.01	6,608,054

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	236	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	249	11	\$140	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	84	11	\$58	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	89	11	\$58	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	413	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	435	11	\$210	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	307	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	307	11	\$198	99%	33%	\$0.10	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	324	11	\$198	99%	33%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	155	11	\$116	99%	33%	\$0.12	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	163	11	\$116	99%	33%	\$0.11	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	483	11	\$268	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	509	11	\$268	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	328	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	345	11	\$152	99%	33%	\$0.07	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	176	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	185	11	\$70	99%	33%	\$0.06	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	152	11	\$81	99%	33%	\$0.09	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	160	11	\$81	99%	33%	\$0.08	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	56	11	\$161	71%	30%	\$0.45	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	56	11	\$161	71%	30%	\$0.45	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	59	11	\$161	71%	30%	\$0.43	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	11	11	\$7	71%	30%	\$0.10	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	98	11	\$309	71%	30%	\$0.50	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	104	11	\$309	71%	30%	\$0.47	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	53	11	\$155	71%	30%	\$0.46	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	56	11	\$155	71%	30%	\$0.44	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	45	11	\$154	71%	30%	\$0.54	0.00
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	47	11	\$154	71%	30%	\$0.51	0.00

Table F.1. Residential Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	47	11	\$154	71%	30%	\$0.51	0.00
Electric	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	433	40	\$935	60%	***%	\$0.19	0.00
Electric	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	438	40	\$935	60%	***%	\$0.19	0.00
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	120	10	\$2	75%	65%	\$0.00	1,469,217
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	120	10	\$2	75%	65%	\$0.00	1,469,217
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	125	10	\$2	75%	65%	\$0.00	4,487,413
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	125	10	\$2	75%	65%	\$0.00	4,487,413
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	293	10	\$8	75%	95%	\$0.01	5,214,913
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	293	10	\$8	75%	95%	\$0.01	5,214,913
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	305	10	\$8	75%	95%	\$0.00	15,927,850
Electric	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	305	10	\$8	75%	95%	\$0.00	15,927,850
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	427	10	\$15	100%	65%	\$0.01	20,285,883
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	427	10	\$15	100%	65%	\$0.01	20,285,883
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	432	10	\$15	100%	65%	\$0.01	7,015,397
Electric	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	432	10	\$15	100%	65%	\$0.01	7,015,397
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00
Electric	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	53	15	\$3	100%	0%	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	137	4	\$15	100%	N/A	\$0.04	131,064
Electric	Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	137	4	\$15	100%	N/A	\$0.04	138,605
Electric	Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	137	4	\$15	100%	N/A	\$0.04	38,509
Electric	Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	137	4	\$15	100%	N/A	\$0.04	43,307
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	196	12	\$47	19%	55%	\$0.04	137,268
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	196	12	\$47	19%	55%	\$0.04	177,643
Electric	Grocery	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	557	12	\$356	55%	85%	\$0.10	0.00
Electric	Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	962	12	\$542	14%	75%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	341	12	\$193	19%	90%	\$0.08	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	41	12	\$107	19%	70%	\$0.39	0.00
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	196	12	\$47	19%	55%	\$0.04	18,344
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	196	12	\$47	19%	55%	\$0.04	18,344
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	196	12	\$47	19%	55%	\$0.04	18,454
Electric	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	196	12	\$47	19%	55%	\$0.04	18,454
Electric	Grocery	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	557	12	\$356	55%	85%	\$0.10	0.00
Electric	Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	962	12	\$542	14%	75%	\$0.08	0.00
Electric	Grocery	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,954	15	\$11,757	1.0%	70%	\$0.79	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,961	15	\$11,757	1.0%	70%	\$0.78	0.00
Electric	Grocery	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	651	15	\$1,353	80%	95%	\$0.27	0.00
Electric	Grocery	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	653	15	\$1,353	80%	95%	\$0.27	0.00
Electric	Grocery	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	186	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Grocery	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	475	15	\$351	100%	N/A	\$0.10	0.00
Electric	Grocery	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	977	10	\$2,193	10%	90%	\$0.38	0.00
Electric	Grocery	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	980	10	\$2,193	10%	90%	\$0.38	0.00
Electric	Grocery	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	977	5	\$312	75%	75%	\$0.09	0.00
Electric	Grocery	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	980	5	\$312	75%	75%	\$0.09	1,960,608
Electric	Grocery	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	162	18	\$928	45%	85%	\$0.67	0.00
Electric	Grocery	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	163	18	\$928	45%	85%	\$0.67	0.00
Electric	Grocery	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	3,938	15	\$-7350.3604	35%	N/A	\$-0.31	1,668,879
Electric	Grocery	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	3,938	15	\$-7350.3604	35%	N/A	\$-0.31	3,042,167
Electric	Grocery	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	293	12	\$5,450	10%	85%	\$2.79	0.00
Electric	Grocery	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	294	12	\$5,450	10%	85%	\$2.78	0.00
Electric	Grocery	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	651	40	\$39,179	2.0%	100%	\$5.34	0.00
Electric	Grocery	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	653	40	\$39,179	2.0%	100%	\$5.32	0.00
Electric	Grocery	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	325	12	\$76	10%	60%	\$0.04	87,032
Electric	Grocery	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	326	12	\$76	10%	60%	\$0.04	57,977
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	25	25	\$2,036	45%	65%	\$8.24	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	25	25	\$2,036	45%	65%	\$8.22	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	2	25	\$980	25%	85%	\$44.10	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	2	25	\$980	25%	85%	\$43.96	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	195	20	\$521	45%	60%	\$0.30	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	196	20	\$1,217	45%	60%	\$0.70	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	117	20	\$91	45%	85%	\$0.09	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	117	20	\$213	45%	85%	\$0.20	0.00
Electric	Grocery	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	814	7	\$762	90%	95%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	817	7	\$762	90%	95%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	651	5	\$618	95%	50%	\$0.28	0.00
Electric	Grocery	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	653	5	\$618	95%	50%	\$0.28	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	436	10	\$678	35%	70%	\$0.26	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	436	10	\$678	35%	70%	\$0.26	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	558	10	\$678	35%	70%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	558	10	\$678	35%	70%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	822	25	\$7	15%	90%	\$0.00	639,098
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	824	25	\$7	15%	90%	\$0.00	423,907
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	749	25	\$107	15%	25%	\$0.01	125,741
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	752	25	\$107	15%	25%	\$0.01	83,152
Electric	Grocery	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	197	7	\$2,862	95%	95%	\$3.21	0.00
Electric	Grocery	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	198	7	\$2,862	95%	95%	\$3.20	0.00
Electric	Grocery	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	603	15	\$1,353	80%	95%	\$0.29	0.00
Electric	Grocery	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	605	15	\$1,353	80%	95%	\$0.29	0.00
Electric	Grocery	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	186	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Grocery	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	475	15	\$280	100%	N/A	\$0.08	57,047
Electric	Grocery	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	475	15	\$280	100%	N/A	\$0.08	84,195
Electric	Grocery	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	905	5	\$312	25%	25%	\$0.10	0.00
Electric	Grocery	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	907	5	\$312	25%	25%	\$0.10	20,311
Electric	Grocery	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	3,938	15	\$-5358.7272	35%	N/A	\$-0.23	563,275
Electric	Grocery	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	3,938	15	\$-5358.7272	35%	N/A	\$-0.23	1,086,562

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	271	12	\$5,450	10%	85%	\$3.01	0.00
Electric	Grocery	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	272	12	\$5,450	10%	85%	\$3.00	0.00
Electric	Grocery	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	603	40	\$39,179	2.0%	100%	\$5.76	0.00
Electric	Grocery	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	605	40	\$39,179	2.0%	100%	\$5.75	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	2	25	\$980	75%	85%	\$47.62	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	2	25	\$980	75%	85%	\$47.48	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	108	20	\$91	45%	85%	\$0.09	0.00
Electric	Grocery	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	108	20	\$213	45%	85%	\$0.22	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	436	10	\$678	0.0%	0%	\$0.26	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	436	10	\$678	0.0%	0%	\$0.26	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	558	10	\$678	0.0%	0%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	558	10	\$678	0.0%	0%	\$0.21	0.00
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	761	25	\$7	80%	90%	\$0.00	388,069
Electric	Grocery	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	763	25	\$7	80%	90%	\$0.00	215,528
Electric	Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	8	6	\$0.00	100%	N/A	\$0.00	72,179
Electric	Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	8	6	\$0.00	100%	N/A	\$0.00	75,616
Electric	Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	8	6	\$0.00	100%	N/A	\$0.00	11,283
Electric	Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	8	6	\$0.00	100%	N/A	\$0.00	12,843
Electric	Grocery	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	18	4	\$20	100%	N/A	\$0.40	0.00
Electric	Grocery	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	18	4	\$20	100%	N/A	\$0.40	4
Electric	Grocery	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	18	4	\$20	100%	N/A	\$0.40	6
Electric	Grocery	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	0.90	20	\$0.00	100%	N/A	\$0.00	0.00
Electric	Grocery	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	2	20	\$0.00	100%	N/A	\$0.00	7,082
Electric	Grocery	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	2	20	\$0.00	100%	N/A	\$0.00	-125.352972
Electric	Grocery	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	16	20	\$2	8.8%	100%	\$0.02	15,421
Electric	Grocery	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	16	20	\$2	8.8%	100%	\$0.02	15,421
Electric	Grocery	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	20	20	\$2	8.8%	100%	\$0.01	16,349
Electric	Grocery	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	20	20	\$2	8.8%	100%	\$0.01	16,349
Electric	Grocery	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	0.90	20	\$0.00	100%	N/A	\$0.00	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	2	20	\$0.00	100%	N/A	\$0.00	2,457
Electric	Grocery	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	2	20	\$0.00	100%	N/A	\$0.00	-16.27608
Electric	Grocery	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	403	15	\$1,306	100%	N/A	\$0.42	0.00
Electric	Grocery	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	997	15	\$2,613	100%	N/A	\$0.34	0.00
Electric	Grocery	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,324	15	\$11,757	1.0%	70%	\$0.46	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	565	15	\$1,353	80%	95%	\$0.31	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	565	15	\$1,353	80%	95%	\$0.31	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	751	15	\$1,353	80%	95%	\$0.24	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	751	15	\$1,353	80%	95%	\$0.24	0.00
Electric	Grocery	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,662	5	\$312	75%	75%	\$0.05	1,346,001
Electric	Grocery	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,662	5	\$312	75%	75%	\$0.05	2,948,683
Electric	Grocery	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	277	18	\$928	45%	85%	\$0.40	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	535	14	\$6,652	5.0%	95%	\$1.69	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	535	14	\$6,652	5.0%	95%	\$1.69	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	814	14	\$6,652	5.0%	95%	\$1.11	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	814	14	\$6,652	5.0%	95%	\$1.11	0.00
Electric	Grocery	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	498	12	\$5,450	10%	85%	\$1.64	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	565	40	\$39,179	2.0%	100%	\$6.15	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	565	40	\$39,179	2.0%	100%	\$6.15	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	751	40	\$39,179	2.0%	100%	\$4.63	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	751	40	\$39,179	2.0%	100%	\$4.63	0.00
Electric	Grocery	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	2,853	30	\$77,465	5.0%	N/A	\$2.53	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	831	12	\$76	10%	60%	\$0.01	59,949
Electric	Grocery	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	831	12	\$76	10%	60%	\$0.01	130,762
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	722	25	\$2,036	45%	65%	\$0.29	504,209
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	722	25	\$2,036	45%	65%	\$0.29	504,209
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,077	25	\$2,036	45%	65%	\$0.19	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,077	25	\$2,036	45%	65%	\$0.19	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	91	25	\$980	25%	85%	\$1.10	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	91	25	\$980	25%	85%	\$1.10	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	136	25	\$980	25%	85%	\$0.73	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	136	25	\$980	25%	85%	\$0.73	0.00
Electric	Grocery	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	332	20	\$521	45%	60%	\$0.18	0.00
Electric	Grocery	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	332	20	\$1,217	45%	60%	\$0.41	0.00
Electric	Grocery	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	199	20	\$91	45%	85%	\$0.05	91,309
Electric	Grocery	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	199	20	\$213	45%	85%	\$0.12	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	740	25	\$3,635	15%	85%	\$0.50	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	740	25	\$3,635	15%	85%	\$0.50	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,361	25	\$3,635	15%	85%	\$0.27	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,361	25	\$3,635	15%	85%	\$0.27	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	146	25	\$1,121	15%	95%	\$0.78	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	146	25	\$1,121	15%	95%	\$0.78	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	265	25	\$1,121	15%	95%	\$0.43	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	265	25	\$1,121	15%	95%	\$0.43	0.00
Electric	Grocery	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,767	25	\$8,938	10%	45%	\$0.52	0.00
Electric	Grocery	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,385	7	\$762	90%	95%	\$0.12	0.00
Electric	Grocery	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,385	7	\$762	90%	95%	\$0.12	3,356,058
Electric	Grocery	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	1,108	3	\$618	95%	50%	\$0.25	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	222	10	\$678	35%	70%	\$0.52	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	222	10	\$678	35%	70%	\$0.52	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	378	10	\$678	35%	70%	\$0.30	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	378	10	\$678	35%	70%	\$0.30	0.00
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	693	25	\$7	15%	90%	\$0.00	144,037
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	693	25	\$7	15%	90%	\$0.00	313,369

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	760	25	\$107	15%	25%	\$0.01	34,361
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	760	25	\$107	15%	25%	\$0.01	74,420
Electric	Grocery	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	403	15	\$1,045	100%	N/A	\$0.34	0.00
Electric	Grocery	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	997	15	\$2,090	100%	N/A	\$0.27	99
Electric	Grocery	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	997	15	\$2,090	100%	N/A	\$0.27	120
Electric	Grocery	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	334	7	\$2,862	95%	95%	\$1.89	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	520	15	\$1,353	80%	95%	\$0.34	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	520	15	\$1,353	80%	95%	\$0.34	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	692	15	\$1,353	80%	95%	\$0.26	0.00
Electric	Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	692	15	\$1,353	80%	95%	\$0.26	0.00
Electric	Grocery	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,531	5	\$312	25%	25%	\$0.06	18,587
Electric	Grocery	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,531	5	\$312	25%	25%	\$0.06	31,819
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	493	14	\$6,652	5.0%	95%	\$1.84	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	493	14	\$6,652	5.0%	95%	\$1.84	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	750	14	\$6,652	5.0%	95%	\$1.21	0.00
Electric	Grocery	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	750	14	\$6,652	5.0%	95%	\$1.21	0.00
Electric	Grocery	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	459	12	\$5,450	10%	85%	\$1.78	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	520	40	\$39,179	2.0%	100%	\$6.68	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	520	40	\$39,179	2.0%	100%	\$6.68	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	692	40	\$39,179	2.0%	100%	\$5.02	0.00
Electric	Grocery	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	692	40	\$39,179	2.0%	100%	\$5.02	0.00
Electric	Grocery	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	2,853	30	\$39,793	5.0%	N/A	\$1.28	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	83	25	\$980	75%	85%	\$1.19	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	83	25	\$980	75%	85%	\$1.19	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	125	25	\$980	75%	85%	\$0.79	0.00
Electric	Grocery	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	125	25	\$980	75%	85%	\$0.79	0.00
Electric	Grocery	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	183	20	\$91	45%	85%	\$0.06	9,889
Electric	Grocery	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	183	20	\$213	45%	85%	\$0.13	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	134	25	\$1,121	15%	95%	\$0.85	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	134	25	\$1,121	15%	95%	\$0.85	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	245	25	\$1,121	15%	95%	\$0.47	0.00
Electric	Grocery	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	245	25	\$1,121	15%	95%	\$0.47	0.00
Electric	Grocery	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	150	25	\$934	95%	85%	\$0.63	0.00
Electric	Grocery	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	150	25	\$934	95%	85%	\$0.63	31,500
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	New	222	10	\$678	0.0%	0%	\$0.52	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	New	222	10	\$678	0.0%	0%	\$0.52	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	New	378	10	\$678	0.0%	0%	\$0.30	0.00
Electric	Grocery	Heat Pump	Window Film	Window Film	No Film	Per Building	New	378	10	\$678	0.0%	0%	\$0.30	0.00
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	639	25	\$7	80%	90%	\$0.00	85,782
Electric	Grocery	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	639	25	\$7	80%	90%	\$0.00	159,419
Electric	Grocery	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	880	8	\$422	75%	70%	\$0.10	0.00
Electric	Grocery	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	730	15	\$765	62%	90%	\$0.14	0.00
Electric	Grocery	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	730	15	\$1,787	62%	90%	\$0.32	0.00
Electric	Grocery	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	369	8	\$548	45%	90%	\$0.30	0.00
Electric	Grocery	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	369	8	\$1,280	45%	90%	\$0.69	0.00
Electric	Grocery	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	362	8	\$100	5.0%	50%	\$0.06	0.00
Electric	Grocery	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	704	17	\$478	75%	50%	\$0.08	0.00
Electric	Grocery	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	304	8	\$51	25%	25%	\$0.03	189,671
Electric	Grocery	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	304	8	\$119	25%	25%	\$0.08	0.00
Electric	Grocery	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	880	8	\$422	75%	70%	\$0.10	0.00
Electric	Grocery	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	730	15	\$765	62%	90%	\$0.14	0.00
Electric	Grocery	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	730	15	\$1,787	62%	90%	\$0.32	0.00
Electric	Grocery	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	369	8	\$548	45%	90%	\$0.30	0.00
Electric	Grocery	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	369	8	\$1,280	45%	90%	\$0.69	0.00
Electric	Grocery	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	362	8	\$100	5.0%	50%	\$0.06	0.00
Electric	Grocery	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	704	17	\$478	75%	50%	\$0.08	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	629	10	\$249	5.0%	75%	\$0.07	0.00
Electric	Grocery	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	629	10	\$582	5.0%	75%	\$0.16	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,760	8	\$3,868	5.0%	95%	\$0.21	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,760	8	\$3,868	5.0%	95%	\$0.21	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,743	8	\$3,868	5.0%	95%	\$0.13	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,743	8	\$3,868	5.0%	95%	\$0.13	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,820	8	\$2,901	5.0%	95%	\$0.21	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,820	8	\$2,901	5.0%	95%	\$0.21	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,307	8	\$2,901	5.0%	95%	\$0.13	0.00
Electric	Grocery	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,307	8	\$2,901	5.0%	95%	\$0.13	0.00
Electric	Grocery	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	3,226	6	\$1,197	85%	80%	\$0.06	0.00
Electric	Grocery	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	1,979	6	\$1,004	85%	80%	\$0.11	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,662	13	\$20,238	50%	N/A	\$0.63	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,662	13	\$20,238	50%	N/A	\$0.63	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,664	13	\$20,366	50%	N/A	\$0.63	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,664	13	\$20,366	50%	N/A	\$0.63	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,043	13	\$418	100%	N/A	\$0.09	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,043	13	\$418	100%	N/A	\$0.09	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,044	13	\$410	100%	N/A	\$0.09	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,044	13	\$410	100%	N/A	\$0.09	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,918	13	\$427	100%	N/A	\$0.00	6,531,475

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,919	13	\$437	100%	N/A	\$0.00	6,906,346
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,170	13	\$1,886	100%	N/A	\$0.14	0.00
Electric	Grocery	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,171	13	\$1,887	100%	N/A	\$0.14	0.00
Electric	Grocery	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,862	8	\$548	5.0%	90%	\$0.04	1,160,171
Electric	Grocery	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,862	8	\$1,280	5.0%	90%	\$0.09	0.00
Electric	Grocery	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,359	8	\$51	5.0%	25%	\$0.00	319,476
Electric	Grocery	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,359	8	\$119	5.0%	25%	\$0.01	289,340
Electric	Grocery	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	825	15	\$290	100%	N/A	\$0.06	0.00
Electric	Grocery	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,077	15	\$1,198	95%	N/A	\$0.14	0.00
Electric	Grocery	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	913	13	\$8,824	50%	N/A	\$1.34	0.00
Electric	Grocery	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	555	9	\$10	25%	N/A	\$-0.03	206,914
Electric	Grocery	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	555	9	\$10	25%	N/A	\$-0.03	217,693
Electric	Grocery	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	250	15	\$5,581	100%	N/A	\$2.77	0.00
Electric	Grocery	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	414	8	\$548	5.0%	90%	\$0.26	0.00
Electric	Grocery	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	414	8	\$1,280	5.0%	90%	\$0.62	0.00
Electric	Grocery	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	341	8	\$51	10%	25%	\$0.03	88,560
Electric	Grocery	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	341	8	\$119	10%	25%	\$0.07	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	260	11	\$101	95%	65%	\$0.06	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	260	11	\$101	95%	65%	\$0.06	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	607	11	\$236	95%	65%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	607	11	\$236	95%	65%	\$0.06	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	52	13	\$44	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	52	13	\$44	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	121	13	\$104	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	121	13	\$104	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	650	10	\$249	5.0%	75%	\$0.07	0.00
Electric	Grocery	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	650	10	\$582	5.0%	75%	\$0.15	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,044	8	\$3,868	5.0%	95%	\$0.25	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,044	8	\$3,868	5.0%	95%	\$0.25	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,650	8	\$3,868	5.0%	95%	\$0.17	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,650	8	\$3,868	5.0%	95%	\$0.17	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,283	8	\$2,901	5.0%	95%	\$0.25	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,283	8	\$2,901	5.0%	95%	\$0.25	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,487	8	\$2,901	5.0%	95%	\$0.17	0.00
Electric	Grocery	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,487	8	\$2,901	5.0%	95%	\$0.17	0.00
Electric	Grocery	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	1,993	6	\$486	85%	80%	\$0.02	1,534,471
Electric	Grocery	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	1,993	6	\$486	85%	80%	\$0.02	1,812,224
Electric	Grocery	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	899	6	\$350	85%	80%	\$0.08	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	52	13	\$44	95%	95%	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	52	13	\$44	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	121	13	\$104	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	121	13	\$104	95%	95%	\$0.12	0.00
Electric	Grocery	Lighting Interior Other	Lighting Package - High Efficiency	12% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,252	13	\$9,693	100%	N/A	\$0.42	0.00
Electric	Grocery	Lighting Interior Other	Lighting Package - High Efficiency	12% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,252	13	\$9,693	100%	N/A	\$0.42	0.00
Electric	Grocery	Lighting Interior Other	Lighting Package - High Efficiency	12% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,903	13	\$9,540	100%	N/A	\$0.35	0.00
Electric	Grocery	Lighting Interior Other	Lighting Package - High Efficiency	12% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,903	13	\$9,540	100%	N/A	\$0.35	0.00
Electric	Grocery	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	2,960	8	\$548	5.0%	90%	\$0.04	170,695
Electric	Grocery	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	2,960	8	\$1,280	5.0%	90%	\$0.09	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,227	4	\$15	85%	N/A	-\$0.02	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,159	4	\$25	85%	N/A	-\$0.02	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,698	1	\$4	100%	N/A	\$0.01	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,698	1	\$4	100%	N/A	\$0.01	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,313	1	\$7	100%	N/A	\$0.01	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,313	1	\$7	100%	N/A	\$0.01	0.00
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,251	12	\$402	85%	N/A	\$0.00	3,064,708
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,251	12	\$402	85%	N/A	\$0.00	3,064,708
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,199	12	\$644	85%	N/A	\$0.00	4,670,781

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,199	12	\$644	85%	N/A	\$0.00	4,670,781
Electric	Grocery	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	377	8	\$548	5.0%	90%	\$0.29	0.00
Electric	Grocery	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	377	8	\$1,280	5.0%	90%	\$0.68	0.00
Electric	Grocery	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	311	8	\$51	1.0%	25%	\$0.03	3,012
Electric	Grocery	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	311	8	\$119	1.0%	25%	\$0.08	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.38	10%	90%	\$0.04	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.38	10%	90%	\$0.04	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	4	7	\$1	10%	90%	\$0.05	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	4	7	\$1	10%	90%	\$0.05	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	13	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	30	10	\$0.00	95%	75%	\$0.00	253,384
Electric	Grocery	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	30	10	\$0.00	95%	75%	\$0.00	282,164
Electric	Grocery	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	746	10	\$527	75%	85%	\$0.12	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	60	4	\$11	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	60	4	\$11	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	140	4	\$27	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	140	4	\$27	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.38	10%	90%	\$0.04	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.38	10%	90%	\$0.04	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	4	7	\$1	10%	90%	\$0.05	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	4	7	\$1	10%	90%	\$0.05	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	13	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Grocery	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	30	10	\$0.00	95%	75%	\$0.00	29,439

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	30	10	\$0.00	95%	75%	\$0.00	33,966
Electric	Grocery	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	746	10	\$527	75%	85%	\$0.12	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	60	4	\$11	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	60	4	\$11	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	140	4	\$27	60%	90%	\$0.07	0.00
Electric	Grocery	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	140	4	\$27	60%	90%	\$0.07	0.00
Electric	Grocery	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	23	6	\$29	100%	N/A	\$0.31	0.00
Electric	Grocery	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	23	6	\$29	100%	N/A	\$0.31	7
Electric	Grocery	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	23	6	\$29	100%	N/A	\$0.31	11
Electric	Grocery	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	59	6	\$8	100%	N/A	\$0.04	4,599
Electric	Grocery	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	59	6	\$8	100%	N/A	\$0.04	8,051
Electric	Grocery	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	59	6	\$8	100%	N/A	\$0.04	0.00
Electric	Grocery	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	3,782	8	\$324	90%	75%	\$0.02	24,220,745
Electric	Grocery	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	3,782	8	\$324	90%	75%	\$0.02	26,658,257
Electric	Grocery	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	6,275	15	\$1,524	100%	50%	\$0.03	30,956,677
Electric	Grocery	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	6,275	15	\$1,524	100%	50%	\$0.03	34,072,076
Electric	Grocery	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	4,336	15	\$469	95%	90%	\$0.01	36,575,449
Electric	Grocery	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	4,336	15	\$469	95%	90%	\$0.01	40,256,306
Electric	Grocery	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	322	15	\$211	95%	90%	\$0.09	0.00
Electric	Grocery	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	Existing	4,245	10	\$3,521	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	5,763	10	\$4,773	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Compressor VSD Retrofit	VSD Compressor	Constant Speed Compressor	Per Building	Existing	11,634	13	\$1,720	60%	85%	\$0.02	54,736,894
Electric	Grocery	Refrigeration	Compressor VSD Retrofit	VSD Compressor	Constant Speed Compressor	Per Building	Existing	11,634	13	\$1,720	60%	85%	\$0.02	60,245,472
Electric	Grocery	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	Existing	1,350	10	\$3,300	95%	70%	\$0.42	0.00
Electric	Grocery	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	624	8	\$61	50%	95%	\$0.02	2,925,253
Electric	Grocery	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	624	8	\$61	50%	95%	\$0.02	3,219,643
Electric	Grocery	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	387	15	\$349	35%	80%	\$0.12	0.00
Electric	Grocery	Refrigeration	Floating Condenser Head Pressure Controls	Floating Condenser Head Pressure Controls	No Floating Condenser Head Pressure Controls	Per Building	Existing	2,678	15	\$911	50%	90%	\$0.04	10,123,844

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Refrigeration	Floating Condenser Head Pressure Controls	Floating Condenser Head Pressure Controls	No Floating Condenser Head Pressure Controls	Per Building	Existing	2,678	15	\$911	50%	90%	\$0.04	11,142,681
Electric	Grocery	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	477	12	\$452	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	1,560	5	\$248	95%	65%	\$0.05	7,999,337
Electric	Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	1,560	5	\$248	95%	65%	\$0.05	8,804,370
Electric	Grocery	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	Existing	5,260	3	\$825	95%	90%	\$0.07	0.00
Electric	Grocery	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	375	12	-\$88,1904	95%	80%	-\$0.04	2,817,445
Electric	Grocery	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	375	12	-\$88,1904	95%	80%	-\$0.04	3,100,985
Electric	Grocery	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Building	Existing	683	4	\$493	95%	80%	\$0.26	0.00
Electric	Grocery	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	633	15	\$703	75%	95%	\$0.15	0.00
Electric	Grocery	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	3,782	8	\$324	90%	20%	\$0.02	769,221
Electric	Grocery	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	3,782	8	\$324	90%	20%	\$0.02	897,802
Electric	Grocery	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	5,009	15	\$1,217	100%	50%	\$0.03	2,767,061
Electric	Grocery	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	5,009	15	\$1,217	100%	50%	\$0.03	3,244,015
Electric	Grocery	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	3,388	10	\$2,810	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	4,600	10	\$3,810	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	New	1,077	10	\$3,300	95%	70%	\$0.52	0.00
Electric	Grocery	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	498	8	\$48	50%	95%	\$0.02	268,334
Electric	Grocery	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	498	8	\$48	50%	95%	\$0.02	313,188
Electric	Grocery	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	387	15	\$349	35%	80%	\$0.12	0.00
Electric	Grocery	Refrigeration	Floating Condenser Head Pressure Controls	Floating Condenser Head Pressure Controls	No Floating Condenser Head Pressure Controls	Per Building	New	2,678	15	\$911	50%	90%	\$0.04	1,271,893
Electric	Grocery	Refrigeration	Floating Condenser Head Pressure Controls	Floating Condenser Head Pressure Controls	No Floating Condenser Head Pressure Controls	Per Building	New	2,678	15	\$911	50%	90%	\$0.04	1,491,128
Electric	Grocery	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	477	12	\$452	95%	80%	\$0.14	0.00
Electric	Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	1,560	5	\$248	95%	65%	\$0.05	1,028,295
Electric	Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	1,560	5	\$248	95%	65%	\$0.05	1,200,182
Electric	Grocery	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	New	2,099	3	\$255	80%	90%	\$0.06	0.00
Electric	Grocery	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	375	12	-\$88,1904	95%	80%	-\$0.04	323,761

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	375	12	-\$88,1904	95%	80%	\$-0.04	377,881
Electric	Grocery	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Building	New	683	4	\$493	95%	80%	\$0.26	0.00
Electric	Grocery	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	633	15	\$703	75%	95%	\$0.15	0.00
Electric	Grocery	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	30	20	\$82	100%	N/A	\$0.31	0.00
Electric	Grocery	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	34	20	\$111	100%	N/A	\$0.37	0.00
Electric	Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	26	20	\$6	100%	N/A	\$0.03	27,741
Electric	Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	26	20	\$6	100%	N/A	\$0.03	29,112
Electric	Grocery	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	8	20	\$3	100%	N/A	\$0.04	0.00
Electric	Grocery	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	208	20	\$22	8.8%	100%	\$0.01	140,038
Electric	Grocery	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	208	20	\$22	8.8%	100%	\$0.01	140,038
Electric	Grocery	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	212	20	\$21	8.8%	100%	\$0.01	159,123
Electric	Grocery	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	212	20	\$21	8.8%	100%	\$0.01	159,123
Electric	Grocery	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	30	20	\$82	100%	N/A	\$0.31	0.00
Electric	Grocery	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	34	20	\$111	100%	N/A	\$0.37	0.00
Electric	Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	26	20	\$6	100%	N/A	\$0.03	12,458
Electric	Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	26	20	\$6	100%	N/A	\$0.03	13,071
Electric	Grocery	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	8	20	\$3	100%	N/A	\$0.04	0.00
Electric	Grocery	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	225	15	\$1,353	80%	95%	\$0.78	0.00
Electric	Grocery	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	287	15	\$1,353	80%	95%	\$0.62	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	413	15	\$9,101	2.5%	65%	\$2.88	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	526	15	\$9,101	2.5%	65%	\$2.26	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	413	15	\$7,517	2.5%	65%	\$2.38	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	526	15	\$7,517	2.5%	65%	\$1.87	0.00
Electric	Grocery	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	101	12	\$5,450	10%	85%	\$8.06	0.00
Electric	Grocery	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	129	12	\$5,450	10%	85%	\$6.33	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	225	40	\$39,179	2.0%	100%	\$15.41	0.00
Electric	Grocery	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	287	40	\$39,179	2.0%	100%	\$12.10	0.00
Electric	Grocery	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	112	12	\$76	10%	60%	\$0.10	7,033
Electric	Grocery	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	143	12	\$76	10%	60%	\$0.08	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8	25	\$2,036	45%	65%	\$23.80	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	11	25	\$2,036	45%	65%	\$18.69	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.78	25	\$980	25%	85%	\$127.32	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.99	25	\$980	25%	85%	\$100.00	0.00
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	210	9	\$49	100%	N/A	\$0.04	25,832
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	210	9	\$49	100%	N/A	\$0.04	25,832
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	268	9	\$49	100%	N/A	\$0.03	0.00
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	268	9	\$49	100%	N/A	\$0.03	0.00
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	284	25	\$7	15%	90%	\$0.00	51,428
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	362	25	\$7	15%	90%	\$0.00	0.00
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	259	25	\$107	15%	25%	\$0.04	10,088
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	330	25	\$107	15%	25%	\$0.03	0.00
Electric	Grocery	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	225	15	\$1,353	80%	95%	\$0.78	0.00
Electric	Grocery	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	287	15	\$1,353	80%	95%	\$0.62	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	413	15	\$7,280	2.5%	65%	\$2.30	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	526	15	\$7,280	2.5%	65%	\$1.81	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	413	15	\$6,013	2.5%	65%	\$1.90	0.00
Electric	Grocery	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	526	15	\$6,013	2.5%	65%	\$1.49	0.00
Electric	Grocery	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	101	12	\$5,450	10%	85%	\$8.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	129	12	\$5,450	10%	85%	\$6.33	0.00
Electric	Grocery	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	225	40	\$39,179	2.0%	100%	\$15.41	0.00
Electric	Grocery	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	287	40	\$39,179	2.0%	100%	\$12.10	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.78	25	\$980	75%	85%	\$127.32	0.00
Electric	Grocery	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.99	25	\$980	75%	85%	\$100.00	0.00
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	210	9	\$49	100%	N/A	\$0.04	8,871
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	210	9	\$49	100%	N/A	\$0.04	8,871
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	268	9	\$49	100%	N/A	\$0.03	0.00
Electric	Grocery	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	268	9	\$49	100%	N/A	\$0.03	0.00
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	284	25	\$7	80%	90%	\$0.00	27,262
Electric	Grocery	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	362	25	\$7	80%	90%	\$0.00	0.00
Electric	Grocery	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	4,237	15	\$7,520	2.5%	65%	\$0.23	0.00
Electric	Grocery	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	307	12	\$5,450	10%	85%	\$2.66	0.00
Electric	Grocery	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	682	12	\$76	10%	60%	\$0.02	0.00
Electric	Grocery	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	682	12	\$76	10%	60%	\$0.02	26,920
Electric	Grocery	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,342	25	\$2,036	45%	65%	\$0.15	0.00
Electric	Grocery	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	170	25	\$980	25%	85%	\$0.59	0.00
Electric	Grocery	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,641	25	\$3,635	15%	85%	\$0.23	0.00
Electric	Grocery	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	305	25	\$1,121	15%	95%	\$0.37	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	827	25	\$8,938	10%	45%	\$1.10	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	827	25	\$8,938	10%	45%	\$1.10	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,170	25	\$8,938	10%	45%	\$0.42	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,170	25	\$8,938	10%	45%	\$0.42	0.00
Electric	Grocery	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	4,237	15	\$5,156	2.5%	65%	\$0.16	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	307	12	\$5,450	10%	85%	\$2.66	0.00
Electric	Grocery	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	170	25	\$980	75%	85%	\$0.59	0.00
Electric	Grocery	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	305	25	\$1,121	15%	95%	\$0.37	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	827	25	\$934	95%	85%	\$0.12	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	827	25	\$934	95%	85%	\$0.12	0.00
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,170	25	\$934	95%	85%	\$0.04	134,582
Electric	Grocery	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,170	25	\$934	95%	85%	\$0.04	134,582
Electric	Grocery	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	23	9	\$3	100%	N/A	\$0.02	142,487
Electric	Grocery	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	23	9	\$3	100%	N/A	\$0.02	148,404
Electric	Grocery	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	23	9	\$3	100%	N/A	\$0.02	19,015
Electric	Grocery	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	23	9	\$3	100%	N/A	\$0.02	21,597
Electric	Grocery	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,949	15	\$11,757	1.0%	70%	\$0.52	0.00
Electric	Grocery	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,474	5	\$312	75%	75%	\$0.06	0.00
Electric	Grocery	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	245	18	\$928	45%	85%	\$0.45	0.00
Electric	Grocery	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,474	14	\$6,652	5.0%	95%	\$0.61	0.00
Electric	Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	442	12	\$5,450	10%	85%	\$1.85	0.00
Electric	Grocery	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	983	12	\$76	10%	60%	\$0.01	124,076
Electric	Grocery	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	983	12	\$76	10%	60%	\$0.01	167,737
Electric	Grocery	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,934	25	\$2,036	45%	65%	\$0.11	0.00
Electric	Grocery	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	245	25	\$980	25%	85%	\$0.41	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	294	20	\$521	45%	60%	\$0.20	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	294	20	\$1,217	45%	60%	\$0.46	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	176	20	\$91	45%	85%	\$0.06	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	176	20	\$213	45%	85%	\$0.14	0.00
Electric	Grocery	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,364	25	\$3,635	15%	85%	\$0.16	0.00
Electric	Grocery	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	440	25	\$1,121	15%	95%	\$0.26	0.00
Electric	Grocery	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	3,126	25	\$8,938	10%	45%	\$0.29	0.00
Electric	Grocery	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,228	7	\$762	90%	95%	\$0.14	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	322	7	\$2,862	95%	95%	\$1.97	0.00
Electric	Grocery	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,474	5	\$312	25%	25%	\$0.06	0.00
Electric	Grocery	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,474	14	\$6,652	5.0%	95%	\$0.61	0.00
Electric	Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	442	12	\$5,450	10%	85%	\$1.85	0.00
Electric	Grocery	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	245	25	\$980	75%	85%	\$0.41	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	176	20	\$91	45%	85%	\$0.06	0.00
Electric	Grocery	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	176	20	\$213	45%	85%	\$0.14	0.00
Electric	Grocery	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	440	25	\$1,121	15%	95%	\$0.26	0.00
Electric	Grocery	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,191	25	\$934	95%	85%	\$0.08	0.00
Electric	Grocery	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	321	10	\$44	100%	N/A	\$0.02	1,056,785
Electric	Grocery	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	321	10	\$44	100%	N/A	\$0.02	1,066,372
Electric	Grocery	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	321	10	\$44	100%	N/A	\$0.02	192,832
Electric	Grocery	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	321	10	\$44	100%	N/A	\$0.02	218,527
Electric	Grocery	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	1,101	10	\$474	5.0%	90%	\$0.07	0.00
Electric	Grocery	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,652	15	\$11,757	1.0%	70%	\$0.93	0.00
Electric	Grocery	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	1,119	18	\$2,400	95%	65%	\$0.25	0.00
Electric	Grocery	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	56	15	\$25	95%	90%	\$0.06	0.00
Electric	Grocery	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	1,404	20	\$430	55%	65%	\$0.03	2,852,300
Electric	Grocery	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	1,404	20	\$430	55%	65%	\$0.03	2,855,591
Electric	Grocery	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	68	7	\$19	65%	25%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	1,101	10	\$474	5.0%	90%	\$0.07	0.00
Electric	Grocery	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	1,119	18	\$2,400	95%	65%	\$0.25	0.00
Electric	Grocery	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	56	15	\$25	95%	90%	\$0.06	0.00
Electric	Grocery	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	1,404	20	\$430	55%	45%	\$0.03	196,379
Electric	Grocery	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	1,404	20	\$430	55%	45%	\$0.03	230,651
Electric	Grocery	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	41	10	\$1,074	75%	95%	\$4.42	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	14	12	\$39	45%	35%	\$0.42	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	74	12	\$42	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	74	12	\$42	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	86	12	\$49	40%	95%	\$0.08	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	86	12	\$49	40%	95%	\$0.08	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	68	12	\$42	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	68	12	\$42	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	79	12	\$49	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	79	12	\$49	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	8	12	\$32	75%	75%	\$0.58	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	165	25	\$999	2.5%	95%	\$0.62	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	31	9	\$0.38	95%	75%	\$0.00	34,216

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	31	9	\$0.77	95%	75%	\$0.00	37,393
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.38	95%	50%	\$0.01	7,816
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.38	95%	50%	\$0.01	8,542
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	4	9	\$7	95%	25%	\$0.29	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	4	9	\$18	95%	25%	\$0.67	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	322	4	\$97	95%	75%	\$0.11	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	20	10	\$117	75%	95%	\$0.97	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	20	10	\$275	75%	95%	\$2.26	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	94	10	\$2,730	55%	95%	\$4.92	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	94	10	\$6,370	55%	95%	\$11.49	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	493	15	\$403	75%	N/A	\$0.14	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	487	15	\$240	75%	N/A	\$0.10	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	40	10	\$1,074	75%	95%	\$4.45	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	14	12	\$39	45%	35%	\$0.42	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	70	12	\$39	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	70	12	\$39	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	83	12	\$47	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	83	12	\$47	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	64	12	\$39	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	64	12	\$39	40%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	76	12	\$47	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	76	12	\$47	40%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	163	25	\$800	2.5%	95%	\$0.50	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	31	9	\$0.38	95%	75%	\$0.00	3,448
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	31	9	\$0.77	95%	75%	\$0.00	2,839
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	13	9	\$0.38	95%	50%	\$0.01	787
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	13	9	\$0.38	95%	50%	\$0.01	648
Electric	Grocery	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	322	4	\$97	95%	75%	\$0.11	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	20	10	\$117	75%	95%	\$0.98	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	20	10	\$275	75%	95%	\$2.28	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	93	10	\$2,730	55%	95%	\$4.96	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	93	10	\$6,370	55%	95%	\$11.58	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	493	15	\$403	75%	N/A	\$0.14	0.00
Electric	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	487	15	\$240	75%	N/A	\$0.10	0.00
Electric	Grocery	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	43	10	\$1,074	50%	95%	\$4.23	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	14	12	\$39	75%	35%	\$0.42	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	74	12	\$42	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	74	12	\$42	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	86	12	\$49	50%	95%	\$0.08	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	86	12	\$49	50%	95%	\$0.08	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	68	12	\$42	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	68	12	\$42	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	79	12	\$49	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	79	12	\$49	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	8	12	\$32	75%	75%	\$0.56	0.00
Electric	Grocery	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	172	25	\$999	2.5%	95%	\$0.59	0.00
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	33	9	\$0.38	95%	75%	\$0.00	81,020
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	33	9	\$0.77	95%	75%	\$0.00	88,548
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.38	95%	50%	\$0.01	18,507
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.38	95%	50%	\$0.01	20,227
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	5	9	\$7	95%	25%	\$0.27	0.00
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	5	9	\$18	95%	25%	\$0.64	0.00
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	322	4	\$97	95%	75%	\$0.11	0.00
Electric	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	21	10	\$117	75%	95%	\$0.93	0.00
Electric	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	21	10	\$275	75%	95%	\$2.16	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	98	10	\$2,730	55%	95%	\$4.71	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	98	10	\$6,370	55%	95%	\$10.99	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	456	15	\$2,069	75%	N/A	\$0.66	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	26	15	\$90	100%	N/A	\$0.44	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	41	10	\$1,074	50%	95%	\$4.36	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 gal/cycle	Per Building	New	14	12	\$39	75%	35%	\$0.42	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	70	12	\$39	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	70	12	\$39	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	83	12	\$47	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	83	12	\$47	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	64	12	\$39	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	64	12	\$39	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	76	12	\$47	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	76	12	\$47	50%	95%	\$0.09	0.00
Electric	Grocery	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	167	25	\$800	2.5%	95%	\$0.49	0.00
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	32	9	\$0.38	95%	75%	\$0.00	10,338
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	32	9	\$0.77	95%	75%	\$0.00	8,625
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	13	9	\$0.38	95%	50%	\$0.01	2,361
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	13	9	\$0.38	95%	50%	\$0.01	1,970
Electric	Grocery	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	322	4	\$97	95%	75%	\$0.11	0.00
Electric	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	20	10	\$117	75%	95%	\$0.96	0.00
Electric	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	20	10	\$275	75%	95%	\$2.23	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	95	10	\$2,730	55%	95%	\$4.86	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	95	10	\$6,370	55%	95%	\$11.33	0.00
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	456	15	\$2,069	75%	N/A	\$0.66	21
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	456	15	\$2,069	75%	N/A	\$0.66	47
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	26	15	\$90	100%	N/A	\$0.44	-4.092672
Electric	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	26	15	\$90	100%	N/A	\$0.44	-36.361884
Electric	Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	2,065	4	\$236	100%	N/A	\$0.04	462,719
Electric	Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	2,065	4	\$236	100%	N/A	\$0.04	500,113
Electric	Health	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	3,187	4	\$236	95%	65%	\$0.03	6,053,205
Electric	Health	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	3,187	4	\$236	95%	65%	\$0.03	8,007,148
Electric	Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	2,065	4	\$236	100%	N/A	\$0.04	154,858
Electric	Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	2,065	4	\$236	100%	N/A	\$0.04	164,606
Electric	Health	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	3,187	4	\$236	95%	65%	\$0.03	849,697
Electric	Health	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	3,187	4	\$236	95%	65%	\$0.03	874,819
Electric	Health	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	69	12	\$39	7.0%	60%	\$0.09	0.00
Electric	Health	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	3	12	\$7	7.0%	70%	\$0.34	0.00
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	39	12	\$9	7.0%	55%	\$0.04	2,970
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	39	12	\$9	7.0%	55%	\$0.04	2,970
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	39	12	\$9	7.0%	55%	\$0.04	1,565
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	39	12	\$9	7.0%	55%	\$0.04	1,565
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	195	12	\$109	11%	75%	\$0.08	0.00
Electric	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	195	12	\$109	11%	75%	\$0.08	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	69	12	\$39	7.0%	60%	\$0.09	0.00
Electric	Health	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	3	12	\$7	7.0%	70%	\$0.34	0.00
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	39	12	\$9	7.0%	55%	\$0.04	308
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	39	12	\$9	7.0%	55%	\$0.04	308
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	39	12	\$9	7.0%	55%	\$0.04	209
Electric	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	39	12	\$9	7.0%	55%	\$0.04	209
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	112	12	\$72	15%	85%	\$0.10	0.00
Electric	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	195	12	\$109	11%	75%	\$0.08	0.00
Electric	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	195	12	\$109	11%	75%	\$0.08	0.00
Electric	Health	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,536	15	\$877	5.0%	95%	\$0.07	6,515
Electric	Health	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,536	15	\$877	5.0%	95%	\$0.07	62,103
Electric	Health	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	4,775	10	\$18,395	25%	95%	\$0.65	0.00
Electric	Health	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	3,158	10	\$15,937	75%	95%	\$0.86	0.00
Electric	Health	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	3,158	15	\$42,708	45%	90%	\$1.77	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	119	15	\$275	90%	90%	\$0.30	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	119	15	\$275	90%	90%	\$0.30	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	199	15	\$460	90%	90%	\$0.30	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	199	15	\$460	90%	90%	\$0.30	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	71	15	\$128	75%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	71	15	\$128	75%	90%	\$0.24	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	119	15	\$215	75%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	119	15	\$215	75%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	12,685	20	\$7,580	100%	N/A	\$0.07	367,103
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	12,685	20	\$7,580	100%	N/A	\$0.07	4,832,149
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	3,964	20	\$1,263	100%	N/A	\$0.04	0.00
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Premium Efficiency	Premium Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	7,928	20	\$4,633	100%	N/A	\$0.07	0.00
Electric	Health	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	18,948	15	\$71,102	15%	70%	\$0.49	0.00
Electric	Health	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	6,316	15	\$6,366	15%	95%	\$0.13	0.00
Electric	Health	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	5,052	7	\$2,273	10%	95%	\$0.10	0.00
Electric	Health	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	8,842	15	\$203	65%	35%	\$0.00	278,464
Electric	Health	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	8,842	15	\$203	65%	35%	\$0.00	2,654,367
Electric	Health	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	2,526	13	\$1,646	75%	75%	\$0.09	0.00
Electric	Health	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	9,474	5	\$1,461	75%	75%	\$0.05	578,629
Electric	Health	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	9,474	5	\$1,461	75%	75%	\$0.05	5,515,585
Electric	Health	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,842	12	\$5,449	2.5%	85%	\$0.29	0.00
Electric	Health	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	6,316	40	\$84,281	2.0%	100%	\$2.59	0.00
Electric	Health	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,158	12	\$605	10%	60%	\$0.03	17,110
Electric	Health	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,158	12	\$605	10%	60%	\$0.03	162,398
Electric	Health	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	102	25	\$9,580	45%	65%	\$9.52	0.00
Electric	Health	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	21	25	\$4,607	25%	85%	\$21.39	0.00
Electric	Health	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	7,895	7	\$4,609	90%	95%	\$0.13	0.00
Electric	Health	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	7,895	7	\$4,609	90%	95%	\$0.13	670,607
Electric	Health	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	6,316	3	\$2	95%	20%	\$0.00	172,268
Electric	Health	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	6,316	3	\$2	95%	20%	\$0.00	1,642,091

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	2,996	10	\$5,346	35%	70%	\$0.30	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	2,996	10	\$5,346	35%	70%	\$0.30	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	4,457	10	\$5,346	35%	70%	\$0.20	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	4,457	10	\$5,346	35%	70%	\$0.20	0.00
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	7,969	25	\$58	15%	90%	\$0.00	129,222
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	7,969	25	\$58	15%	90%	\$0.00	1,231,769
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	7,268	25	\$849	15%	25%	\$0.01	24,540
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	7,268	25	\$849	15%	25%	\$0.01	234,629
Electric	Health	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	4,052	10	\$16,554	25%	95%	\$0.69	0.00
Electric	Health	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	2,680	10	\$15,937	0.0%	0%	\$1.01	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	71	15	\$128	95%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	71	15	\$128	95%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	119	15	\$215	95%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	119	15	\$215	95%	90%	\$0.24	0.00
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	12,685	20	\$6,824	100%	N/A	\$0.06	142,720
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	12,685	20	\$6,824	100%	N/A	\$0.06	1,650,536
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	3,964	20	\$1,139	100%	N/A	\$0.03	0.00
Electric	Health	Cooling Chillers	Chillers 150-300 tons (screw) - Premium Efficiency	Premium Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	7,928	20	\$4,170	100%	N/A	\$0.06	0.00
Electric	Health	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,758	7	\$17,307	95%	95%	\$2.18	0.00
Electric	Health	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	5,361	15	\$6,366	15%	95%	\$0.16	0.00
Electric	Health	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	4,288	7	\$2,046	10%	95%	\$0.11	0.00
Electric	Health	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	8,041	5	\$1,461	25%	25%	\$0.05	5,992
Electric	Health	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	8,041	5	\$1,461	25%	25%	\$0.05	71,883
Electric	Health	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,412	12	\$5,449	2.5%	85%	\$0.34	0.00
Electric	Health	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	5,361	40	\$84,281	2.0%	100%	\$3.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	18	25	\$4,607	75%	85%	\$25.20	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	2,996	10	\$5,346	0.0%	0%	\$0.30	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	2,996	10	\$5,346	0.0%	0%	\$0.30	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	4,457	10	\$5,346	0.0%	0%	\$0.20	0.00
Electric	Health	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	4,457	10	\$5,346	0.0%	0%	\$0.20	0.00
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	6,764	25	\$58	80%	90%	\$0.00	63,582
Electric	Health	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	6,764	25	\$58	80%	90%	\$0.00	697,778
Electric	Health	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,900	15	\$877	5.0%	95%	\$0.06	76,706
Electric	Health	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	2,272	15	\$877	5.0%	95%	\$0.05	113,721
Electric	Health	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	23,427	15	\$71,102	15%	70%	\$0.40	0.00
Electric	Health	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	28,022	15	\$71,102	15%	70%	\$0.33	0.00
Electric	Health	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	7,809	15	\$6,366	15%	95%	\$0.11	0.00
Electric	Health	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	9,340	15	\$6,366	15%	95%	\$0.09	0.00
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	3,760	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	7,207	15	\$1,861	100%	N/A	\$0.03	587,882
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	7,207	15	\$1,861	100%	N/A	\$0.03	927,700
Electric	Health	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	11,713	10	\$13,263	10%	30%	\$0.19	0.00
Electric	Health	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	14,011	10	\$13,263	10%	30%	\$0.16	0.00
Electric	Health	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	11,713	5	\$1,461	75%	75%	\$0.04	6,812,533
Electric	Health	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	14,011	5	\$1,461	75%	75%	\$0.03	10,099,873
Electric	Health	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	1,952	18	\$5,613	45%	85%	\$0.34	0.00
Electric	Health	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	2,335	18	\$5,613	45%	85%	\$0.28	0.00
Electric	Health	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	48,435	15	\$-39992.851	35%	N/A	\$-0.14	10,114,761

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	48,435	15	\$-39992.851	35%	N/A	\$-0.14	12,062,888
Electric	Health	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,514	12	\$5,449	2.5%	85%	\$0.23	0.00
Electric	Health	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	4,203	12	\$5,449	2.5%	85%	\$0.19	0.00
Electric	Health	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	7,809	40	\$84,281	2.0%	100%	\$2.09	0.00
Electric	Health	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	9,340	40	\$84,281	2.0%	100%	\$1.75	0.00
Electric	Health	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,904	12	\$605	10%	60%	\$0.02	202,223
Electric	Health	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	4,670	12	\$605	10%	60%	\$0.02	299,438
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	126	25	\$9,580	45%	65%	\$7.70	0.00
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	151	25	\$9,580	45%	65%	\$6.44	0.00
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	27	25	\$4,607	25%	85%	\$17.30	0.00
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	32	25	\$4,607	25%	85%	\$14.46	0.00
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,342	20	\$694	45%	60%	\$0.03	544,366
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,802	20	\$1,167	45%	60%	\$0.05	732,146
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	1,405	20	\$123	45%	85%	\$0.01	467,321
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	1,681	20	\$203	45%	85%	\$0.01	685,150
Electric	Health	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	9,761	7	\$4,609	90%	95%	\$0.10	0.00
Electric	Health	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	11,676	7	\$4,609	90%	95%	\$0.09	11,610,510
Electric	Health	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	7,809	5	\$3,742	95%	50%	\$0.14	0.00
Electric	Health	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	9,340	5	\$3,742	95%	50%	\$0.12	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	2,996	10	\$5,346	35%	70%	\$0.30	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	2,996	10	\$5,346	35%	70%	\$0.30	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	4,457	10	\$5,346	35%	70%	\$0.20	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	4,457	10	\$5,346	35%	70%	\$0.20	0.00
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	9,852	25	\$58	15%	90%	\$0.00	1,495,276
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	11,785	25	\$58	15%	90%	\$0.00	2,198,855
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	8,986	25	\$849	15%	25%	\$0.01	294,192
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	10,749	25	\$849	15%	25%	\$0.01	432,620

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	2,391	7	\$17,307	95%	95%	\$1.60	0.00
Electric	Health	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	2,828	7	\$17,307	95%	95%	\$1.36	0.00
Electric	Health	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	7,289	15	\$6,366	15%	95%	\$0.11	0.00
Electric	Health	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	8,623	15	\$6,366	15%	95%	\$0.10	0.00
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.0 EER	Per Building	New	3,760	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	7,207	15	\$1,487	100%	N/A	\$0.03	216,363
Electric	Health	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	7,207	15	\$1,487	100%	N/A	\$0.03	329,118
Electric	Health	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	10,934	5	\$1,461	25%	25%	\$0.04	88,457
Electric	Health	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	12,934	5	\$1,461	25%	25%	\$0.03	101,264
Electric	Health	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	48,435	15	\$-29879.448	35%	N/A	\$-0.11	2,414,199
Electric	Health	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	48,435	15	\$-29879.448	35%	N/A	\$-0.11	2,844,422
Electric	Health	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,280	12	\$5,449	2.5%	85%	\$0.25	0.00
Electric	Health	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,880	12	\$5,449	2.5%	85%	\$0.21	0.00
Electric	Health	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	7,289	40	\$84,281	2.0%	100%	\$2.24	0.00
Electric	Health	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	8,623	40	\$84,281	2.0%	100%	\$1.90	0.00
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	25	25	\$4,607	75%	85%	\$18.53	0.00
Electric	Health	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	29	25	\$4,607	75%	85%	\$15.67	0.00
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	1,312	20	\$123	45%	85%	\$0.01	47,064
Electric	Health	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	1,552	20	\$203	45%	85%	\$0.01	58,895
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	2,996	10	\$5,346	0.0%	0%	\$0.30	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	2,996	10	\$5,346	0.0%	0%	\$0.30	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	4,457	10	\$5,346	0.0%	0%	\$0.20	0.00
Electric	Health	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	4,457	10	\$5,346	0.0%	0%	\$0.20	0.00
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	9,197	25	\$58	80%	90%	\$0.00	864,611

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	10,880	25	\$58	80%	90%	\$0.00	1,081,958
Electric	Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	82	6	\$2	100%	N/A	\$0.01	216,753
Electric	Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	82	6	\$2	100%	N/A	\$0.01	269,733
Electric	Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	82	6	\$2	100%	N/A	\$0.01	38,567
Electric	Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	82	6	\$2	100%	N/A	\$0.01	40,248
Electric	Health	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	279	4	\$315	100%	N/A	\$0.40	0.00
Electric	Health	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	279	4	\$315	100%	N/A	\$0.40	30
Electric	Health	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	279	4	\$315	100%	N/A	\$0.40	34
Electric	Health	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	10	20	\$2	100%	N/A	\$0.02	0.00
Electric	Health	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	29	20	\$2	100%	N/A	\$0.01	33,021
Electric	Health	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	29	20	\$2	100%	N/A	\$0.01	-491.982624
Electric	Health	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	205	20	\$28	8.8%	100%	\$0.02	84,048
Electric	Health	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	205	20	\$28	8.8%	100%	\$0.02	84,048
Electric	Health	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	242	20	\$30	8.8%	100%	\$0.01	75,011
Electric	Health	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	242	20	\$30	8.8%	100%	\$0.01	75,011
Electric	Health	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	10	20	\$2	100%	N/A	\$0.02	0.00
Electric	Health	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	29	20	\$2	100%	N/A	\$0.01	11,458
Electric	Health	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	29	20	\$2	100%	N/A	\$0.01	-63.881424
Electric	Health	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.0 EER, 3.3 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	3,351	15	\$73,320	100%	N/A	\$18.47	0.00
Electric	Health	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	7,194	15	\$7,608	100%	N/A	\$0.14	0.00
Electric	Health	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	2,654	15	\$877	5.0%	95%	\$0.04	0.00
Electric	Health	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	2,654	15	\$877	5.0%	95%	\$0.04	51,017
Electric	Health	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	29,319	15	\$71,102	15%	70%	\$0.32	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,067	15	\$6,366	15%	95%	\$0.40	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,067	15	\$6,366	15%	95%	\$0.40	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,938	15	\$6,366	15%	95%	\$0.21	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,938	15	\$6,366	15%	95%	\$0.21	0.00
Electric	Health	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	14,659	5	\$1,461	75%	75%	\$0.03	0.00
Electric	Health	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	14,659	5	\$1,461	75%	75%	\$0.03	4,064,659
Electric	Health	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	2,443	18	\$5,613	45%	85%	\$0.27	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	8,752	14	\$40,229	5.0%	95%	\$0.63	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	8,752	14	\$40,229	5.0%	95%	\$0.63	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	11,558	14	\$40,229	5.0%	95%	\$0.47	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	11,558	14	\$40,229	5.0%	95%	\$0.47	0.00
Electric	Health	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	4,397	12	\$5,449	2.5%	85%	\$0.19	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,067	40	\$84,281	2.0%	100%	\$7.91	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,067	40	\$84,281	2.0%	100%	\$7.91	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,938	40	\$84,281	2.0%	100%	\$4.15	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,938	40	\$84,281	2.0%	100%	\$4.15	0.00
Electric	Health	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	31,605	30	\$71,183	5.0%	N/A	\$1.39	0.00
Electric	Health	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	7,329	12	\$605	10%	60%	\$0.01	0.00
Electric	Health	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	7,329	12	\$605	10%	60%	\$0.01	181,034
Electric	Health	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,814	25	\$9,580	45%	65%	\$0.14	642,895
Electric	Health	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,814	25	\$9,580	45%	65%	\$0.14	642,895
Electric	Health	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8,949	25	\$9,580	45%	65%	\$0.11	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8,949	25	\$9,580	45%	65%	\$0.11	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,459	25	\$4,607	25%	85%	\$0.32	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,459	25	\$4,607	25%	85%	\$0.32	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,916	25	\$4,607	25%	85%	\$0.24	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,916	25	\$4,607	25%	85%	\$0.24	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,931	20	\$694	45%	60%	\$0.03	0.00
Electric	Health	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,931	20	\$1,167	45%	60%	\$0.04	294,151
Electric	Health	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	1,759	20	\$123	45%	85%	\$0.01	0.00
Electric	Health	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	1,759	20	\$203	45%	85%	\$0.01	275,736
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	15,500	25	\$17,099	15%	85%	\$0.11	728,405
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	15,500	25	\$17,099	15%	85%	\$0.11	728,405
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	21,745	25	\$17,099	15%	85%	\$0.08	0.00
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	21,745	25	\$17,099	15%	85%	\$0.08	0.00
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	3,021	25	\$5,276	15%	95%	\$0.18	136,028
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	3,021	25	\$5,276	15%	95%	\$0.18	136,028
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	4,228	25	\$5,276	15%	95%	\$0.13	0.00
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	4,228	25	\$5,276	15%	95%	\$0.13	0.00
Electric	Health	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	15,586	25	\$42,039	10%	45%	\$0.27	0.00
Electric	Health	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	12,216	7	\$4,609	90%	95%	\$0.08	0.00
Electric	Health	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	12,216	7	\$4,609	90%	95%	\$0.08	4,570,373
Electric	Health	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	9,773	3	\$3,742	95%	50%	\$0.17	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	633	10	\$5,346	35%	70%	\$1.43	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	633	10	\$5,346	35%	70%	\$1.43	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,796	10	\$5,346	35%	70%	\$0.51	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,796	10	\$5,346	35%	70%	\$0.51	0.00
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,496	25	\$58	15%	90%	\$0.00	0.00
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,496	25	\$58	15%	90%	\$0.00	176,240
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	4,060	25	\$849	15%	25%	\$0.02	0.00
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	4,060	25	\$849	15%	25%	\$0.02	56,737
Electric	Health	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.0 EER, 3.3 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	3,351	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Health	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	7,194	15	\$6,085	100%	N/A	\$0.11	136
Electric	Health	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	7,194	15	\$6,085	100%	N/A	\$0.11	0.00
Electric	Health	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	3,025	7	\$17,307	95%	95%	\$1.27	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,951	15	\$6,366	15%	95%	\$0.43	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,951	15	\$6,366	15%	95%	\$0.43	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,717	15	\$6,366	15%	95%	\$0.22	0.00
Electric	Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,717	15	\$6,366	15%	95%	\$0.22	0.00
Electric	Health	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	13,837	5	\$1,461	25%	25%	\$0.03	0.00
Electric	Health	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	13,837	5	\$1,461	25%	25%	\$0.03	45,318
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	8,261	14	\$40,229	5.0%	95%	\$0.66	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	8,261	14	\$40,229	5.0%	95%	\$0.66	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	10,910	14	\$40,229	5.0%	95%	\$0.50	0.00
Electric	Health	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	10,910	14	\$40,229	5.0%	95%	\$0.50	0.00
Electric	Health	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	4,151	12	\$5,449	2.5%	85%	\$0.20	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,951	40	\$84,281	2.0%	100%	\$8.38	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,951	40	\$84,281	2.0%	100%	\$8.38	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,717	40	\$84,281	2.0%	100%	\$4.40	0.00
Electric	Health	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,717	40	\$84,281	2.0%	100%	\$4.40	0.00
Electric	Health	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER 4.0 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	31,605	30	\$42,328	5.0%	N/A	\$0.71	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,377	25	\$4,607	75%	85%	\$0.34	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,377	25	\$4,607	75%	85%	\$0.34	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,809	25	\$4,607	75%	85%	\$0.26	0.00
Electric	Health	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,809	25	\$4,607	75%	85%	\$0.26	0.00
Electric	Health	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	1,660	20	\$123	45%	85%	\$0.01	0.00
Electric	Health	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	1,660	20	\$203	45%	85%	\$0.01	26,357
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	2,852	25	\$5,276	15%	95%	\$0.19	16,394
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	2,852	25	\$5,276	15%	95%	\$0.19	16,394
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	3,991	25	\$5,276	15%	95%	\$0.13	0.00
Electric	Health	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	3,991	25	\$5,276	15%	95%	\$0.13	0.00
Electric	Health	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,360	25	\$4,394	95%	85%	\$0.33	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,360	25	\$4,394	95%	85%	\$0.33	44,863
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	New	633	10	\$5,346	0.0%	0%	\$1.43	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	New	633	10	\$5,346	0.0%	0%	\$1.43	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,796	10	\$5,346	0.0%	0%	\$0.51	0.00
Electric	Health	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,796	10	\$5,346	0.0%	0%	\$0.51	0.00
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,356	25	\$58	80%	90%	\$0.00	0.00
Electric	Health	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,356	25	\$58	80%	90%	\$0.00	90,806
Electric	Health	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	2,939	8	\$916	75%	70%	\$0.06	0.00
Electric	Health	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	2,441	15	\$563	62%	90%	\$0.03	5,161,330
Electric	Health	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	2,441	15	\$944	62%	90%	\$0.05	0.00
Electric	Health	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,092	8	\$729	90%	90%	\$0.13	0.00
Electric	Health	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,092	8	\$1,225	90%	90%	\$0.22	0.00
Electric	Health	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	2,190	8	\$610	5.0%	50%	\$0.06	0.00
Electric	Health	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	4,261	17	\$2,895	75%	50%	\$0.08	0.00
Electric	Health	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,017	8	\$65	25%	25%	\$0.01	240,877
Electric	Health	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,017	8	\$109	25%	25%	\$0.02	311,261
Electric	Health	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	2,939	8	\$916	75%	70%	\$0.06	0.00
Electric	Health	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	2,441	15	\$563	62%	90%	\$0.03	678,031
Electric	Health	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	2,441	15	\$944	62%	90%	\$0.05	0.00
Electric	Health	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,092	8	\$729	90%	90%	\$0.13	0.00
Electric	Health	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,092	8	\$1,225	90%	90%	\$0.22	0.00
Electric	Health	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	2,190	8	\$610	5.0%	50%	\$0.06	0.00
Electric	Health	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	4,261	17	\$2,895	75%	50%	\$0.08	0.00
Electric	Health	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	2,442	10	\$332	25%	75%	\$0.02	1,511,215
Electric	Health	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	2,442	10	\$558	25%	75%	\$0.04	1,925,748
Electric	Health	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	14,920	8	\$10,789	15%	50%	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	14,920	8	\$10,789	15%	50%	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	19,309	8	\$10,789	15%	50%	\$0.11	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	19,309	8	\$10,789	15%	50%	\$0.11	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	11,190	8	\$8,092	15%	50%	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	11,190	8	\$8,092	15%	50%	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	14,482	8	\$8,092	15%	50%	\$0.11	0.00
Electric	Health	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	14,482	8	\$8,092	15%	50%	\$0.11	0.00
Electric	Health	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	321	6	\$119	15%	80%	\$0.06	0.00
Electric	Health	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	197	6	\$100	10%	80%	\$0.12	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	19,042	13	\$15,609	50%	N/A	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	19,042	13	\$15,609	50%	N/A	\$0.14	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	19,230	13	\$13,900	50%	N/A	\$0.12	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	19,230	13	\$13,900	50%	N/A	\$0.12	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,263	13	\$5,049	100%	N/A	\$0.19	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,263	13	\$5,049	100%	N/A	\$0.19	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,305	13	\$5,243	100%	N/A	\$0.20	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,305	13	\$5,243	100%	N/A	\$0.20	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	7,836	13	\$13,493	100%	N/A	\$0.31	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	7,836	13	\$13,493	100%	N/A	\$0.31	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,951	13	\$13,813	100%	N/A	\$0.28	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,951	13	\$13,813	100%	N/A	\$0.28	0.00
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	7,913	13	\$1,464	100%	N/A	\$0.04	-2091792.5107

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	7,913	13	\$1,464	100%	N/A	\$0.04	-2091792.5107
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,864	13	\$1,464	100%	N/A	\$0.03	-1216934.9829
Electric	Health	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,864	13	\$1,464	100%	N/A	\$0.03	-1216934.9829
Electric	Health	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	9,831	8	\$729	75%	90%	\$0.01	23,155,740
Electric	Health	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	9,831	8	\$1,225	75%	90%	\$0.02	29,507,456
Electric	Health	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	9,159	8	\$65	5.0%	25%	\$0.00	480,540
Electric	Health	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	9,159	8	\$109	5.0%	25%	\$0.00	612,354
Electric	Health	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	496	15	\$278	100%	N/A	\$0.09	0.00
Electric	Health	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	649	15	\$928	95%	N/A	\$0.18	0.00
Electric	Health	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	549	16	\$6,380	50%	N/A	\$1.42	0.00
Electric	Health	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	334	11	\$77	25%	N/A	\$0.01	45,352
Electric	Health	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	334	11	\$77	25%	N/A	\$0.01	56,525
Electric	Health	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	150	15	\$4,062	100%	N/A	\$3.39	0.00
Electric	Health	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	230	8	\$729	75%	90%	\$0.63	0.00
Electric	Health	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	230	8	\$1,225	75%	90%	\$1.07	0.00
Electric	Health	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	214	8	\$65	10%	25%	\$0.06	0.00
Electric	Health	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	214	8	\$109	10%	25%	\$0.10	0.00
Electric	Health	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	581	11	\$226	95%	65%	\$0.06	0.00
Electric	Health	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	581	11	\$226	95%	65%	\$0.06	0.00
Electric	Health	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	974	11	\$378	95%	65%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	974	11	\$378	95%	65%	\$0.06	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	116	13	\$98	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	116	13	\$98	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	194	13	\$168	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	194	13	\$168	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	2,209	10	\$332	25%	75%	\$0.03	199,102
Electric	Health	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	2,209	10	\$558	25%	75%	\$0.04	200,262
Electric	Health	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	10,351	8	\$10,789	15%	50%	\$0.21	0.00
Electric	Health	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	10,351	8	\$10,789	15%	50%	\$0.21	0.00
Electric	Health	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	13,396	8	\$10,789	15%	50%	\$0.16	0.00
Electric	Health	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	13,396	8	\$10,789	15%	50%	\$0.16	0.00
Electric	Health	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	7,763	8	\$8,092	15%	50%	\$0.21	0.00
Electric	Health	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	7,763	8	\$8,092	15%	50%	\$0.21	0.00
Electric	Health	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	10,047	8	\$8,092	15%	50%	\$0.16	0.00
Electric	Health	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	10,047	8	\$8,092	15%	50%	\$0.16	0.00
Electric	Health	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	185	6	\$44	15%	80%	\$0.02	11,330
Electric	Health	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	185	6	\$44	15%	80%	\$0.02	11,396
Electric	Health	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	83	6	\$32	15%	80%	\$0.07	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	116	13	\$98	95%	95%	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	116	13	\$98	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	194	13	\$168	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	194	13	\$168	95%	95%	\$0.12	0.00
Electric	Health	Lighting Interior Other	Lighting Package - High Efficiency	9% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	5,523	13	\$8,373	100%	N/A	\$0.22	0.00
Electric	Health	Lighting Interior Other	Lighting Package - High Efficiency	9% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	5,523	13	\$8,373	100%	N/A	\$0.22	0.00
Electric	Health	Lighting Interior Other	Lighting Package - High Efficiency	9% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	9,942	13	\$5,508	100%	N/A	\$0.08	0.00
Electric	Health	Lighting Interior Other	Lighting Package - High Efficiency	9% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	9,942	13	\$5,508	100%	N/A	\$0.08	0.00
Electric	Health	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	8,892	8	\$729	75%	90%	\$0.02	3,051,422
Electric	Health	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	8,892	8	\$1,225	75%	90%	\$0.03	3,068,536
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	50,583	4	\$294	85%	N/A	\$-0.02	0.00
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	68,354	4	\$397	85%	N/A	\$-0.02	0.00
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	42,288	1	\$91	100%	N/A	\$0.01	0.00
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	57,145	1	\$121	100%	N/A	\$0.01	0.00
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	50,968	12	\$7,493	85%	N/A	\$0.01	12,775,844
Electric	Health	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	68,873	12	\$10,125	85%	N/A	\$0.01	13,034,790
Electric	Health	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	3,602	8	\$729	75%	90%	\$0.04	4,396,289
Electric	Health	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	3,602	8	\$1,225	75%	90%	\$0.07	0.00
Electric	Health	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	3,356	8	\$65	1.0%	25%	\$0.00	18,233
Electric	Health	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	3,356	8	\$109	1.0%	25%	\$0.01	14,508
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	10	7	\$4	10%	90%	\$0.10	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	10	7	\$4	10%	90%	\$0.10	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	127	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	127	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	118	10	\$0.00	95%	75%	\$0.00	371,568
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	118	10	\$0.00	95%	75%	\$0.00	491,508
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	118	10	\$0.00	95%	75%	\$0.00	371,568
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	118	10	\$0.00	95%	75%	\$0.00	491,508
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	266	4	\$53	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	266	4	\$53	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	446	4	\$88	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	446	4	\$88	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	10	7	\$4	10%	90%	\$0.10	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	10	7	\$4	10%	90%	\$0.10	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	127	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	127	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	127	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Health	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	127	4	\$0.00	10%	45%	\$0.00	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	118	10	\$0.00	95%	75%	\$0.00	49,809
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	118	10	\$0.00	95%	75%	\$0.00	51,281
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	118	10	\$0.00	95%	75%	\$0.00	49,809
Electric	Health	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	118	10	\$0.00	95%	75%	\$0.00	51,281
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	41	10	\$28	5.0%	85%	\$0.12	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	266	4	\$53	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	266	4	\$53	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	446	4	\$88	60%	90%	\$0.07	0.00
Electric	Health	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	446	4	\$88	60%	90%	\$0.07	0.00
Electric	Health	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	224	6	\$280	100%	N/A	\$0.31	0.00
Electric	Health	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	224	6	\$280	100%	N/A	\$0.31	32
Electric	Health	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	224	6	\$280	100%	N/A	\$0.31	40
Electric	Health	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$149	75%	25%	\$0.00	0.00
Electric	Health	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	517	6	\$74	100%	N/A	\$0.04	18,073
Electric	Health	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	517	6	\$74	100%	N/A	\$0.04	26,630
Electric	Health	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	517	6	\$74	100%	N/A	\$0.04	0.00
Electric	Health	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	651	8	\$56	5.0%	75%	\$0.02	91,456
Electric	Health	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	651	8	\$56	5.0%	75%	\$0.02	119,571
Electric	Health	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	625	15	\$152	5.0%	50%	\$0.03	58,691
Electric	Health	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	625	15	\$152	5.0%	50%	\$0.03	76,733
Electric	Health	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	432	15	\$46	5.0%	90%	\$0.01	72,993
Electric	Health	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	432	15	\$46	5.0%	90%	\$0.01	95,432
Electric	Health	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	55	15	\$37	5.0%	90%	\$0.09	0.00
Electric	Health	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	Existing	423	10	\$350	2.5%	80%	\$0.14	0.00
Electric	Health	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	574	10	\$477	2.5%	80%	\$0.14	0.00
Electric	Health	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	Existing	134	10	\$3,300	5.0%	70%	\$4.16	0.00
Electric	Health	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	62	8	\$7	5.0%	95%	\$0.02	11,092

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	62	8	\$7	5.0%	95%	\$0.02	14,501
Electric	Health	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	11	15	\$9	35%	80%	\$0.11	0.00
Electric	Health	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	13	12	\$14	95%	80%	\$0.15	0.00
Electric	Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	268	5	\$42	95%	90%	\$0.05	856,557
Electric	Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	268	5	\$42	95%	90%	\$0.05	1,119,877
Electric	Health	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	Existing	524	3	\$81	10%	90%	\$0.07	0.00
Electric	Health	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	10	12	\$-2.3389	95%	80%	\$-0.03	30,530
Electric	Health	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	10	12	\$-2.3389	95%	80%	\$-0.03	39,915
Electric	Health	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Building	Existing	19	4	\$14	15%	80%	\$0.25	0.00
Electric	Health	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	109	15	\$121	2.5%	95%	\$0.15	0.00
Electric	Health	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	651	8	\$56	5.0%	20%	\$0.02	3,276
Electric	Health	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	651	8	\$56	5.0%	20%	\$0.02	3,334
Electric	Health	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	466	15	\$114	5.0%	50%	\$0.03	5,746
Electric	Health	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	466	15	\$114	5.0%	50%	\$0.03	5,822
Electric	Health	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	315	10	\$261	2.5%	80%	\$0.14	0.00
Electric	Health	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	428	10	\$355	2.5%	80%	\$0.14	0.00
Electric	Health	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	New	100	10	\$3,300	5.0%	70%	\$5.58	0.00
Electric	Health	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	46	8	\$4	5.0%	95%	\$0.02	1,109
Electric	Health	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	46	8	\$4	5.0%	95%	\$0.02	1,129
Electric	Health	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	11	15	\$9	35%	80%	\$0.11	0.00
Electric	Health	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	13	12	\$14	95%	80%	\$0.15	0.00
Electric	Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	268	5	\$42	95%	90%	\$0.05	115,244
Electric	Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	268	5	\$42	95%	90%	\$0.05	117,289
Electric	Health	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	New	195	3	\$23	5.0%	90%	\$0.05	0.00
Electric	Health	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	10	12	\$-2.3389	95%	80%	\$-0.03	4,094
Electric	Health	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	10	12	\$-2.3389	95%	80%	\$-0.03	4,167

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	19	4	\$14	15%	80%	\$0.25	0.00
Electric	Health	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	109	15	\$121	2.5%	95%	\$0.15	0.00
Electric	Health	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	367	20	\$998	100%	N/A	\$0.31	0.00
Electric	Health	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	411	20	\$1,337	100%	N/A	\$0.36	0.00
Electric	Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	322	20	\$77	100%	N/A	\$0.03	133,569
Electric	Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	322	20	\$77	100%	N/A	\$0.03	151,192
Electric	Health	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	102	20	\$35	100%	N/A	\$0.04	0.00
Electric	Health	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	2,517	20	\$266	8.8%	100%	\$0.01	642,514
Electric	Health	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	2,517	20	\$266	8.8%	100%	\$0.01	642,514
Electric	Health	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	2,568	20	\$257	8.8%	100%	\$0.01	867,244
Electric	Health	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	2,568	20	\$257	8.8%	100%	\$0.01	867,244
Electric	Health	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	367	20	\$998	100%	N/A	\$0.31	0.00
Electric	Health	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	411	20	\$1,337	100%	N/A	\$0.36	0.00
Electric	Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	322	20	\$77	100%	N/A	\$0.03	57,160
Electric	Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	322	20	\$77	100%	N/A	\$0.03	71,240
Electric	Health	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	102	20	\$35	100%	N/A	\$0.04	0.00
Electric	Health	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	169	15	\$6,366	15%	95%	\$4.90	0.00
Electric	Health	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	216	15	\$6,366	15%	95%	\$3.85	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	311	15	\$55,036	2.5%	65%	\$23.11	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	396	15	\$55,036	2.5%	65%	\$18.15	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	311	15	\$45,456	2.5%	65%	\$19.09	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	396	15	\$45,456	2.5%	65%	\$14.99	0.00
Electric	Health	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	76	12	\$5,449	2.5%	85%	\$10.70	0.00
Electric	Health	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	97	12	\$5,449	2.5%	85%	\$8.41	0.00
Electric	Health	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	169	40	\$84,281	2.0%	100%	\$96.29	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	216	40	\$84,281	2.0%	100%	\$75.63	0.00
Electric	Health	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	84	12	\$605	10%	60%	\$1.07	0.00
Electric	Health	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	108	12	\$605	10%	60%	\$0.84	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$9,580	45%	65%	\$354.14	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$9,580	45%	65%	\$278.15	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.59	25	\$4,607	25%	85%	\$795.27	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.75	25	\$4,607	25%	85%	\$624.63	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	202	9	\$49	100%	N/A	\$0.04	32,722
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	202	9	\$49	100%	N/A	\$0.04	32,722
Electric	Health	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	214	25	\$58	15%	90%	\$0.03	0.00
Electric	Health	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	272	25	\$58	15%	90%	\$0.02	17,635
Electric	Health	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	195	25	\$849	15%	25%	\$0.44	0.00
Electric	Health	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	248	25	\$849	15%	25%	\$0.35	0.00
Electric	Health	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	169	15	\$6,366	15%	95%	\$4.90	0.00
Electric	Health	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	216	15	\$6,366	15%	95%	\$3.85	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	311	15	\$44,029	2.5%	65%	\$18.49	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	396	15	\$44,029	2.5%	65%	\$14.52	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	311	15	\$36,367	2.5%	65%	\$15.27	0.00
Electric	Health	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	396	15	\$36,367	2.5%	65%	\$11.99	0.00
Electric	Health	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	76	12	\$5,449	2.5%	85%	\$10.70	0.00
Electric	Health	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	97	12	\$5,449	2.5%	85%	\$8.41	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	169	40	\$84,281	2.0%	100%	\$96.29	0.00
Electric	Health	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	216	40	\$84,281	2.0%	100%	\$75.63	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.59	25	\$4,607	75%	85%	\$795.27	0.00
Electric	Health	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.75	25	\$4,607	75%	85%	\$624.63	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	202	9	\$49	100%	N/A	\$0.04	7,519
Electric	Health	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	202	9	\$49	100%	N/A	\$0.04	7,519
Electric	Health	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	214	25	\$58	80%	90%	\$0.03	0.00
Electric	Health	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	272	25	\$58	80%	90%	\$0.02	10,929
Electric	Health	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	2,857	15	\$45,477	2.5%	65%	\$2.08	0.00
Electric	Health	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	207	12	\$5,449	2.5%	85%	\$3.95	0.00
Electric	Health	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	460	12	\$605	10%	60%	\$0.20	0.00
Electric	Health	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	535	25	\$9,580	45%	65%	\$1.82	0.00
Electric	Health	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	114	25	\$4,607	25%	85%	\$4.09	0.00
Electric	Health	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,106	25	\$17,099	15%	85%	\$1.57	0.00
Electric	Health	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	206	25	\$5,276	15%	95%	\$2.61	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	557	25	\$42,039	10%	45%	\$7.68	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	557	25	\$42,039	10%	45%	\$7.68	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,463	25	\$42,039	10%	45%	\$2.93	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,463	25	\$42,039	10%	45%	\$2.93	0.00
Electric	Health	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	2,857	15	\$31,186	2.5%	65%	\$1.43	0.00
Electric	Health	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	207	12	\$5,449	2.5%	85%	\$3.95	0.00
Electric	Health	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	114	25	\$4,607	75%	85%	\$4.09	0.00
Electric	Health	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	206	25	\$5,276	15%	95%	\$2.61	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	557	25	\$4,394	95%	85%	\$0.80	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	557	25	\$4,394	95%	85%	\$0.80	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,463	25	\$4,394	95%	85%	\$0.31	0.00
Electric	Health	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,463	25	\$4,394	95%	85%	\$0.31	0.00
Electric	Health	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	115	9	\$14	100%	N/A	\$0.02	261,893
Electric	Health	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	115	9	\$14	100%	N/A	\$0.02	324,013
Electric	Health	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	Existing	398	4	\$1,494	10%	65%	\$1.33	0.00
Electric	Health	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	115	9	\$14	100%	N/A	\$0.02	39,696
Electric	Health	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	115	9	\$14	100%	N/A	\$0.02	41,516
Electric	Health	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	New	397	4	\$1,494	10%	65%	\$1.33	0.00
Electric	Health	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	277	15	\$877	5.0%	95%	\$0.41	0.00
Electric	Health	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,776	15	\$71,102	15%	70%	\$3.35	0.00
Electric	Health	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,388	5	\$1,461	75%	75%	\$0.31	0.00
Electric	Health	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	231	18	\$5,613	45%	85%	\$2.87	0.00
Electric	Health	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,388	14	\$40,229	5.0%	95%	\$3.95	0.00
Electric	Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	416	12	\$5,449	2.5%	85%	\$1.96	0.00
Electric	Health	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	925	12	\$605	10%	60%	\$0.10	0.00
Electric	Health	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,077	25	\$9,580	45%	65%	\$0.91	0.00
Electric	Health	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	230	25	\$4,607	25%	85%	\$2.03	0.00
Electric	Health	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	277	20	\$694	45%	60%	\$0.28	0.00
Electric	Health	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	277	20	\$1,167	45%	60%	\$0.47	0.00
Electric	Health	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	166	20	\$123	45%	85%	\$0.08	0.00
Electric	Health	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	166	20	\$203	45%	85%	\$0.14	0.00
Electric	Health	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,225	25	\$17,099	15%	85%	\$0.78	0.00
Electric	Health	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	414	25	\$5,276	15%	95%	\$1.30	0.00
Electric	Health	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,942	25	\$42,039	10%	45%	\$1.46	0.00
Electric	Health	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,156	7	\$4,609	90%	95%	\$0.88	0.00
Electric	Health	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	303	7	\$17,307	95%	95%	\$12.64	0.00
Electric	Health	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,388	5	\$1,461	25%	25%	\$0.31	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,388	14	\$40,229	5.0%	95%	\$3.95	0.00
Electric	Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	416	12	\$5,449	2.5%	85%	\$1.96	0.00
Electric	Health	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	230	25	\$4,607	75%	85%	\$2.03	0.00
Electric	Health	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	166	20	\$123	45%	85%	\$0.08	0.00
Electric	Health	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	166	20	\$203	45%	85%	\$0.14	0.00
Electric	Health	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	414	25	\$5,276	15%	95%	\$1.30	0.00
Electric	Health	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,121	25	\$4,394	95%	85%	\$0.40	0.00
Electric	Health	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	997	10	\$137	100%	N/A	\$0.02	1,256,192
Electric	Health	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	997	10	\$137	100%	N/A	\$0.02	1,478,782
Electric	Health	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	997	10	\$137	100%	N/A	\$0.02	257,426
Electric	Health	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	997	10	\$137	100%	N/A	\$0.02	269,833
Electric	Health	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	20,543	10	\$2,867	5.0%	90%	\$0.02	2,332,179
Electric	Health	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	20,543	10	\$2,867	5.0%	90%	\$0.02	2,888,315
Electric	Health	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	30,815	15	\$71,102	15%	70%	\$0.30	0.00
Electric	Health	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	130	18	\$297	95%	85%	\$0.27	0.00
Electric	Health	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,047	15	\$154	95%	90%	\$0.02	2,279,764
Electric	Health	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,047	15	\$154	95%	90%	\$0.02	2,823,401
Electric	Health	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	26,193	20	\$2,605	55%	65%	\$0.01	26,221,264
Electric	Health	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	26,193	20	\$2,605	55%	65%	\$0.01	32,474,035
Electric	Health	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	412	7	\$116	65%	25%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	Existing	1,643	18	\$1,702	65%	85%	\$0.12	0.00
Electric	Health	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	20,543	10	\$2,867	5.0%	90%	\$0.02	310,654
Electric	Health	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	20,543	10	\$2,867	5.0%	90%	\$0.02	322,280
Electric	Health	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	130	18	\$297	95%	85%	\$0.27	0.00
Electric	Health	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,047	15	\$154	95%	90%	\$0.02	295,890
Electric	Health	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,047	15	\$154	95%	90%	\$0.02	308,306
Electric	Health	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	26,193	20	\$2,605	55%	45%	\$0.01	2,120,385
Electric	Health	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	26,193	20	\$2,605	55%	45%	\$0.01	2,233,249
Electric	Health	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	New	1,643	18	\$1,702	65%	85%	\$0.12	0.00
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	112	9	\$44	25%	95%	\$0.07	0.00
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	53	14	\$18	5.0%	95%	\$0.05	762
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	53	14	\$18	5.0%	95%	\$0.05	989
Electric	Health	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	388	10	\$6,497	55%	95%	\$2.84	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	8	12	\$23	75%	35%	\$0.44	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	143	12	\$81	10%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	131	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	131	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	77	12	\$507	75%	75%	\$0.98	0.00
Electric	Health	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,555	25	\$16,000	2.5%	95%	\$1.05	0.00
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	300	9	\$2	95%	75%	\$0.00	122,405
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	300	9	\$2	95%	75%	\$0.00	158,903
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	123	9	\$2	95%	50%	\$0.00	33,601
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	123	9	\$2	95%	50%	\$0.00	43,620
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	46	9	\$25	95%	25%	\$0.10	0.00
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	128	4	\$39	95%	95%	\$0.11	0.00
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	134	10	\$9	95%	85%	\$0.01	51,733
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	134	10	\$9	95%	85%	\$0.01	51,733
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	225	10	\$16	95%	85%	\$0.01	112,491
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	225	10	\$16	95%	85%	\$0.01	112,491
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	108	10	\$23	95%	25%	\$0.04	12,271
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	108	10	\$23	95%	25%	\$0.04	12,271
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	181	10	\$37	95%	25%	\$0.03	26,683
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	181	10	\$37	95%	25%	\$0.03	26,683
Electric	Health	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	194	10	\$392	75%	85%	\$0.34	0.00
Electric	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	886	10	\$102	2.5%	95%	\$0.02	10,984

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	886	10	\$173	2.5%	95%	\$0.03	14,117
Electric	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	4,644	15	\$6,448	75%	N/A	\$0.24	0.00
Electric	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	4,589	15	\$3,854	75%	N/A	\$0.17	0.00
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	112	9	\$44	25%	95%	\$0.07	0.00
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	53	14	\$18	5.0%	95%	\$0.05	74
Electric	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	53	14	\$18	5.0%	95%	\$0.05	76
Electric	Health	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	385	10	\$6,497	55%	95%	\$2.86	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	8	12	\$23	75%	35%	\$0.44	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	131	12	\$79	10%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	131	12	\$79	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,542	25	\$12,798	2.5%	95%	\$0.84	0.00
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	298	9	\$2	95%	75%	\$0.00	12,065
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	298	9	\$2	95%	75%	\$0.00	12,338
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	122	9	\$2	95%	50%	\$0.00	3,311
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	122	9	\$2	95%	50%	\$0.00	3,386
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	128	4	\$39	95%	95%	\$0.11	0.00
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	134	10	\$9	95%	85%	\$0.01	5,258
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	134	10	\$9	95%	85%	\$0.01	5,258
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	225	10	\$16	95%	85%	\$0.01	8,612
Electric	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	225	10	\$16	95%	85%	\$0.01	8,612
Electric	Health	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	192	10	\$392	75%	85%	\$0.35	0.00
Electric	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	879	10	\$102	2.5%	95%	\$0.02	1,107
Electric	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	879	10	\$173	2.5%	95%	\$0.03	1,071
Electric	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	4,644	15	\$6,448	75%	N/A	\$0.24	0.00
Electric	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	4,589	15	\$3,854	75%	N/A	\$0.17	0.00
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	112	9	\$44	25%	95%	\$0.07	0.00
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	53	14	\$18	5.0%	95%	\$0.05	1,726
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	53	14	\$18	5.0%	95%	\$0.05	2,241
Electric	Health	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	406	10	\$6,497	75%	95%	\$2.72	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher	Federal Standard 2010 Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Per Building	Existing	8	12	\$23	75%	35%	\$0.44	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	131	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	131	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	81	12	\$507	75%	75%	\$0.94	0.00
Electric	Health	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,625	25	\$16,000	2.5%	95%	\$1.00	0.00
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	314	9	\$2	95%	75%	\$0.00	289,839
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	314	9	\$2	95%	75%	\$0.00	376,284
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	129	9	\$2	95%	50%	\$0.00	79,563
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	129	9	\$2	95%	50%	\$0.00	103,293
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	48	9	\$25	95%	25%	\$0.10	0.00
Electric	Health	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	128	4	\$39	95%	95%	\$0.11	0.00
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	134	10	\$9	95%	85%	\$0.01	117,215
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	134	10	\$9	95%	85%	\$0.01	117,215
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	225	10	\$16	95%	85%	\$0.01	254,893
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	225	10	\$16	95%	85%	\$0.01	254,893

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	108	10	\$23	95%	25%	\$0.04	27,804
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	108	10	\$23	95%	25%	\$0.04	27,804
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	181	10	\$37	95%	25%	\$0.03	60,462
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	181	10	\$37	95%	25%	\$0.03	60,462
Electric	Health	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	203	10	\$392	75%	85%	\$0.33	0.00
Electric	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	926	10	\$102	2.5%	95%	\$0.02	26,025
Electric	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	926	10	\$173	2.5%	95%	\$0.03	33,466
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	4,294	15	\$33,114	75%	N/A	\$1.13	0.00
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	251	15	\$1,445	100%	N/A	\$0.75	0.00
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	112	9	\$44	25%	95%	\$0.07	0.00
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	53	14	\$18	5.0%	95%	\$0.05	222
Electric	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	53	14	\$18	5.0%	95%	\$0.05	224
Electric	Health	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	394	10	\$6,497	75%	95%	\$2.80	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	8	12	\$23	75%	35%	\$0.44	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	116	12	\$65	10%	95%	\$0.08	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	143	12	\$81	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	143	12	\$81	10%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	107	12	\$65	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	131	12	\$79	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	131	12	\$79	10%	95%	\$0.09	0.00
Electric	Health	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,577	25	\$12,798	2.5%	95%	\$0.83	0.00
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	304	9	\$2	95%	75%	\$0.00	36,653
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	304	9	\$2	95%	75%	\$0.00	36,984
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	125	9	\$2	95%	50%	\$0.00	10,061
Electric	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	125	9	\$2	95%	50%	\$0.00	10,152
Electric	Health	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	128	4	\$39	95%	95%	\$0.11	0.00
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	134	10	\$9	95%	85%	\$0.01	15,419
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	134	10	\$9	95%	85%	\$0.01	15,419
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	225	10	\$16	95%	85%	\$0.01	25,595
Electric	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	225	10	\$16	95%	85%	\$0.01	25,595
Electric	Health	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	197	10	\$392	75%	85%	\$0.34	0.00
Electric	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	898	10	\$102	2.5%	95%	\$0.02	3,319
Electric	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	898	10	\$173	2.5%	95%	\$0.03	3,257
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	4,294	15	\$33,114	75%	N/A	\$1.13	90
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	4,294	15	\$33,114	75%	N/A	\$1.13	166

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	251	15	\$1,445	100%	N/A	\$0.75	-16.87614
Electric	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	251	15	\$1,445	100%	N/A	\$0.75	-127.542096
Electric	Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	16,022	4	\$1,830	100%	N/A	\$0.04	1,500,269
Electric	Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	16,022	4	\$1,830	100%	N/A	\$0.04	1,687,715
Electric	Large Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	24,720	4	\$1,830	95%	65%	\$0.03	22,078,371
Electric	Large Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	24,720	4	\$1,830	95%	65%	\$0.03	24,020,311
Electric	Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	16,022	4	\$1,830	100%	N/A	\$0.04	493,796
Electric	Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	16,022	4	\$1,830	100%	N/A	\$0.04	564,827
Electric	Large Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	24,720	4	\$1,830	95%	65%	\$0.03	2,624,334
Electric	Large Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	24,720	4	\$1,830	95%	65%	\$0.03	3,099,175
Electric	Large Office	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	8,264	15	\$4,728	75%	95%	\$0.07	0.00
Electric	Large Office	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	8,264	15	\$4,728	75%	95%	\$0.07	2,301,311
Electric	Large Office	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	15,406	10	\$59,498	25%	95%	\$0.66	0.00
Electric	Large Office	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	10,189	10	\$51,540	75%	95%	\$0.86	0.00
Electric	Large Office	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	10,189	15	\$38,136	45%	45%	\$1.77	0.00
Electric	Large Office	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	905	15	\$2,087	90%	90%	\$0.30	0.00
Electric	Large Office	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	542	15	\$975	75%	90%	\$0.24	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - High Efficiency	High Efficiency - 0.55 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	Existing	8,227	20	\$4,153	100%	N/A	\$0.06	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - Premium Efficiency	Premium Efficiency-0.52 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	Existing	17,720	20	\$8,949	100%	N/A	\$0.06	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - Premium Efficiency	Premium Efficiency-0.52 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	Existing	17,720	20	\$8,949	100%	N/A	\$0.06	1,519,339
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) with VSD - Advanced Efficiency	Advanced Efficiency - 0.47 kW/ton w/VSD (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	Existing	33,542	20	\$32,816	75%	N/A	\$0.11	0.00
Electric	Large Office	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	61,138	15	\$29,976	15%	70%	\$0.49	0.00
Electric	Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	20,379	15	\$8,949	80%	95%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	20,379	15	\$8,949	80%	95%	\$0.06	-1029152.4457
Electric	Large Office	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	16,303	7	\$7,353	10%	95%	\$0.10	0.00
Electric	Large Office	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	16,303	7	\$7,353	10%	95%	\$0.10	640,325
Electric	Large Office	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	28,531	15	\$658	65%	35%	\$0.00	0.00
Electric	Large Office	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	28,531	15	\$658	65%	35%	\$0.00	3,879,135
Electric	Large Office	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	8,151	13	\$5,325	75%	75%	\$0.09	0.00
Electric	Large Office	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	8,151	13	\$5,325	75%	75%	\$0.09	1,939,336
Electric	Large Office	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	30,569	5	\$4,728	75%	75%	\$0.05	0.00
Electric	Large Office	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	30,569	5	\$4,728	75%	75%	\$0.05	8,060,567
Electric	Large Office	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	20,379	40	\$58,919	2.0%	100%	\$1.13	0.00
Electric	Large Office	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	10,189	12	\$2,458	10%	60%	\$0.04	0.00
Electric	Large Office	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	10,189	12	\$2,458	10%	60%	\$0.04	237,332
Electric	Large Office	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	330	25	\$13,458	45%	65%	\$4.15	0.00
Electric	Large Office	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	70	25	\$6,483	25%	85%	\$9.33	0.00
Electric	Large Office	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	25,474	7	\$14,910	90%	95%	\$0.13	0.00
Electric	Large Office	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	20,379	3	\$7	95%	20%	\$0.00	0.00
Electric	Large Office	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	20,379	3	\$7	95%	20%	\$0.00	2,399,779
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	8,831	10	\$21,666	35%	70%	\$0.42	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	8,831	10	\$21,666	35%	70%	\$0.42	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	19,136	10	\$21,666	35%	70%	\$0.19	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	19,136	10	\$21,666	35%	70%	\$0.19	0.00
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	25,713	25	\$226	15%	90%	\$0.00	0.00
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	25,713	25	\$226	15%	90%	\$0.00	1,800,127
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	23,453	25	\$3,442	15%	25%	\$0.01	0.00
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	23,453	25	\$3,442	15%	25%	\$0.01	342,891
Electric	Large Office	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	13,729	10	\$53,545	25%	95%	\$0.66	0.00
Electric	Large Office	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	9,080	10	\$51,540	0.0%	0%	\$0.96	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	542	15	\$975	95%	90%	\$0.24	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - High Efficiency	High Efficiency - 0.55 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	New	8,227	20	\$3,737	100%	N/A	\$0.05	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - Premium Efficiency	Premium Efficiency-0.52 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	New	17,720	20	\$8,056	100%	N/A	\$0.05	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) - Premium Efficiency	Premium Efficiency-0.52 kW/ton (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	New	17,720	20	\$8,056	100%	N/A	\$0.05	63,848
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) with VSD - Advanced Efficiency	Advanced Efficiency - 0.47 kW/ton w/VSD (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	New	33,542	20	\$29,359	75%	N/A	\$0.10	0.00
Electric	Large Office	Cooling Chillers	Chillers > 300 tons (centrifugal) with VSD - Advanced Efficiency	Advanced Efficiency - 0.47 kW/ton w/VSD (full load)	Standard Efficiency - 0.576 kW/ton (full load)	Per Building	New	33,542	20	\$29,359	75%	N/A	\$0.10	1,276,700
Electric	Large Office	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	5,956	7	\$55,981	95%	95%	\$2.08	0.00
Electric	Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	18,160	15	\$8,949	80%	95%	\$0.06	0.00
Electric	Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	18,160	15	\$8,949	80%	95%	\$0.06	684,179
Electric	Large Office	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	14,528	7	\$6,619	10%	95%	\$0.10	0.00
Electric	Large Office	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	14,528	7	\$6,619	10%	95%	\$0.10	78,260
Electric	Large Office	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	27,241	5	\$4,728	0.0%	25%	\$0.05	0.00
Electric	Large Office	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	18,160	40	\$58,919	2.0%	100%	\$1.27	0.00
Electric	Large Office	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	63	25	\$6,483	75%	85%	\$10.47	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	8,831	10	\$21,666	0.0%	0%	\$0.42	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	8,831	10	\$21,666	0.0%	0%	\$0.42	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	19,136	10	\$21,666	0.0%	0%	\$0.19	0.00
Electric	Large Office	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	19,136	10	\$21,666	0.0%	0%	\$0.19	0.00
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	22,913	25	\$226	80%	90%	\$0.00	0.00
Electric	Large Office	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	22,913	25	\$226	80%	90%	\$0.00	1,014,173
Electric	Large Office	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	13,127	15	\$4,728	75%	95%	\$0.05	4,407,367
Electric	Large Office	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	13,867	15	\$4,728	75%	95%	\$0.04	4,972,663
Electric	Large Office	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	97,113	15	\$29,976	15%	70%	\$0.31	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	102,587	15	\$29,976	15%	70%	\$0.29	0.00
Electric	Large Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	32,371	15	\$8,949	35%	95%	\$0.04	4,824,931
Electric	Large Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	34,195	15	\$8,949	35%	95%	\$0.03	5,110,712
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - High Efficiency	High Efficiency - 10.5 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	18,082	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	28,127	15	\$21,386	100%	N/A	\$0.10	950,490
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	28,127	15	\$21,386	100%	N/A	\$0.10	1,230,756
Electric	Large Office	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	48,556	10	\$42,893	10%	20%	\$0.15	0.00
Electric	Large Office	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	51,293	10	\$42,893	10%	20%	\$0.14	0.00
Electric	Large Office	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	48,556	5	\$4,728	75%	75%	\$0.03	19,836,254
Electric	Large Office	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	51,293	5	\$4,728	75%	75%	\$0.03	21,636,333
Electric	Large Office	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	8,092	18	\$18,156	45%	85%	\$0.27	0.00
Electric	Large Office	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	8,548	18	\$18,156	45%	85%	\$0.25	0.00
Electric	Large Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	227,835	15	-\$144718.45	35%	N/A	-\$0.11	21,381,013
Electric	Large Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	227,835	15	-\$144718.45	35%	N/A	-\$0.11	21,588,471
Electric	Large Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	32,371	40	\$58,919	2.0%	100%	\$0.71	0.00
Electric	Large Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	34,195	40	\$58,919	2.0%	100%	\$0.67	0.00
Electric	Large Office	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	16,185	12	\$2,458	10%	60%	\$0.02	476,861
Electric	Large Office	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	17,097	12	\$2,458	10%	60%	\$0.02	523,740
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	525	25	\$13,458	45%	65%	\$2.61	0.00
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	554	25	\$13,458	45%	65%	\$2.47	62,462
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	112	25	\$6,483	25%	85%	\$5.87	0.00
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	118	25	\$6,483	25%	85%	\$5.56	0.00
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9,711	20	\$5,287	45%	60%	\$0.06	1,103,481
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	10,258	20	\$5,287	45%	60%	\$0.06	1,203,618
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	5,826	20	\$938	45%	85%	\$0.02	1,101,983

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	6,155	20	\$938	45%	85%	\$0.02	1,198,379
Electric	Large Office	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	40,464	7	\$14,910	90%	95%	\$0.08	17,499,208
Electric	Large Office	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	42,744	7	\$14,910	90%	95%	\$0.08	19,087,206
Electric	Large Office	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	32,371	5	\$12,104	95%	50%	\$0.11	0.00
Electric	Large Office	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	34,195	5	\$12,104	95%	50%	\$0.10	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	8,831	10	\$21,666	35%	70%	\$0.42	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	8,831	10	\$21,666	35%	70%	\$0.42	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	19,136	10	\$21,666	35%	70%	\$0.19	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	19,136	10	\$21,666	35%	70%	\$0.19	0.00
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	40,843	25	\$226	15%	90%	\$0.00	3,525,989
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	43,145	25	\$226	15%	90%	\$0.00	3,845,961
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	37,253	25	\$3,442	15%	25%	\$0.01	878,140
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	39,353	25	\$3,442	15%	25%	\$0.01	957,829
Electric	Large Office	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	10,358	7	\$55,981	95%	95%	\$1.20	0.00
Electric	Large Office	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	10,929	7	\$55,981	95%	95%	\$1.14	0.00
Electric	Large Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	31,582	15	\$8,949	35%	95%	\$0.04	598,325
Electric	Large Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	33,322	15	\$8,949	35%	95%	\$0.04	507,127
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - High Efficiency	High Efficiency - 10.5 EER	Standard Efficiency - 10.0 EER	Per Building	New	18,082	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	New	28,127	15	\$17,112	100%	N/A	\$0.08	412,522
Electric	Large Office	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	New	28,127	15	\$17,112	100%	N/A	\$0.08	460,290
Electric	Large Office	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	47,373	5	\$4,728	0.0%	25%	\$0.03	0.00
Electric	Large Office	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	49,984	5	\$4,728	0.0%	25%	\$0.03	0.00
Electric	Large Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	New	227,835	15	\$-110297.7	35%	N/A	\$-0.08	5,315,885
Electric	Large Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	New	227,835	15	\$-110297.7	35%	N/A	\$-0.08	6,080,621
Electric	Large Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	31,582	40	\$58,919	2.0%	100%	\$0.73	0.00
Electric	Large Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	33,322	40	\$58,919	2.0%	100%	\$0.69	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	109	25	\$6,483	75%	85%	\$6.02	0.00
Electric	Large Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	115	25	\$6,483	75%	85%	\$5.70	0.00
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	5,684	20	\$938	45%	85%	\$0.02	111,115
Electric	Large Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	5,998	20	\$938	45%	85%	\$0.02	103,364
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	8,831	10	\$21,666	0.0%	0%	\$0.42	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	8,831	10	\$21,666	0.0%	0%	\$0.42	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	19,136	10	\$21,666	0.0%	0%	\$0.19	0.00
Electric	Large Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	19,136	10	\$21,666	0.0%	0%	\$0.19	0.00
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	39,847	25	\$226	80%	90%	\$0.00	2,041,277
Electric	Large Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	42,044	25	\$226	80%	90%	\$0.00	1,898,875
Electric	Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	316	6	\$0.00	100%	N/A	\$0.00	469,561
Electric	Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	316	6	\$0.00	100%	N/A	\$0.00	480,595
Electric	Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	316	6	\$0.00	100%	N/A	\$0.00	71,713
Electric	Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	316	6	\$0.00	100%	N/A	\$0.00	83,550
Electric	Large Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	2,165	4	\$2,435	100%	N/A	\$0.40	0.00
Electric	Large Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	2,165	4	\$2,435	100%	N/A	\$0.40	90
Electric	Large Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	2,165	4	\$2,435	100%	N/A	\$0.40	125
Electric	Large Office	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	23	20	\$7	100%	N/A	\$0.04	0.00
Electric	Large Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	65	20	\$7	100%	N/A	\$0.01	27,915
Electric	Large Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	65	20	\$7	100%	N/A	\$0.01	-505.67976
Electric	Large Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	448	20	\$60	8.8%	100%	\$0.02	71,051
Electric	Large Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	448	20	\$60	8.8%	100%	\$0.02	71,051
Electric	Large Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	529	20	\$60	8.8%	100%	\$0.01	77,100
Electric	Large Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	529	20	\$60	8.8%	100%	\$0.01	77,100
Electric	Large Office	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	23	20	\$7	100%	N/A	\$0.04	0.00
Electric	Large Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	65	20	\$7	100%	N/A	\$0.01	9,686
Electric	Large Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	65	20	\$7	100%	N/A	\$0.01	-65.66058
Electric	Large Office	Heat Pump	Air Source Heat Pump > 240 kBtuh - High Efficiency	High Efficiency - 10.0 EER, 3.3 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	19,467	15	\$23,633	100%	N/A	\$0.16	0.00
Electric	Large Office	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	37,100	15	\$50,261	100%	N/A	\$0.18	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	17,886	15	\$4,728	75%	95%	\$0.03	551,004
Electric	Large Office	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	17,886	15	\$4,728	75%	95%	\$0.03	6,142,794
Electric	Large Office	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	118,514	15	\$29,976	15%	70%	\$0.25	0.00
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	13,992	15	\$8,949	35%	95%	\$0.08	154,365
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	13,992	15	\$8,949	35%	95%	\$0.08	154,365
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	26,366	15	\$8,949	35%	95%	\$0.04	3,727,315
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	26,366	15	\$8,949	35%	95%	\$0.04	3,727,315
Electric	Large Office	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	59,257	5	\$4,728	75%	75%	\$0.02	2,196,330
Electric	Large Office	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	59,257	5	\$4,728	75%	75%	\$0.02	23,939,538
Electric	Large Office	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	9,876	18	\$18,156	45%	85%	\$0.22	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	19,707	14	\$68,614	5.0%	95%	\$0.47	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	19,707	14	\$68,614	5.0%	95%	\$0.47	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	38,267	14	\$68,614	5.0%	95%	\$0.24	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	38,267	14	\$68,614	5.0%	95%	\$0.24	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	13,992	40	\$58,919	2.0%	100%	\$1.64	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	13,992	40	\$58,919	2.0%	100%	\$1.64	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	26,366	40	\$58,919	2.0%	100%	\$0.87	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	26,366	40	\$58,919	2.0%	100%	\$0.87	0.00
Electric	Large Office	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump > 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	160,135	30	\$30,913	5.0%	N/A	\$0.91	0.00
Electric	Large Office	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	29,628	12	\$2,458	10%	60%	\$0.01	101,310
Electric	Large Office	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	29,628	12	\$2,458	10%	60%	\$0.01	1,104,263
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	15,628	25	\$13,458	45%	65%	\$0.09	1,900,431

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	15,628	25	\$13,458	45%	65%	\$0.09	1,900,431
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	29,744	25	\$13,458	45%	65%	\$0.05	334,794
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	29,744	25	\$13,458	45%	65%	\$0.05	334,794
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	3,347	25	\$6,483	25%	85%	\$0.20	256,557
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	3,347	25	\$6,483	25%	85%	\$0.20	256,557
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	6,370	25	\$6,483	25%	85%	\$0.10	44,064
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	6,370	25	\$6,483	25%	85%	\$0.10	44,064
Electric	Large Office	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	11,851	20	\$5,287	45%	60%	\$0.05	120,425
Electric	Large Office	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	11,851	20	\$5,287	45%	60%	\$0.05	1,314,880
Electric	Large Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	7,110	20	\$938	45%	85%	\$0.01	121,903
Electric	Large Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	7,110	20	\$938	45%	85%	\$0.01	1,328,716
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	27,783	25	\$24,026	15%	85%	\$0.09	1,519,716
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	27,783	25	\$24,026	15%	85%	\$0.09	1,519,716
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	69,084	25	\$24,026	15%	85%	\$0.04	358,242
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	69,084	25	\$24,026	15%	85%	\$0.04	358,242
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	5,473	25	\$7,413	15%	95%	\$0.14	281,873
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	5,473	25	\$7,413	15%	95%	\$0.14	281,873
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	13,455	25	\$7,413	15%	95%	\$0.06	71,575
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	13,455	25	\$7,413	15%	95%	\$0.06	71,575
Electric	Large Office	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	63,006	25	\$59,067	10%	45%	\$0.10	92,960
Electric	Large Office	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	63,006	25	\$59,067	10%	45%	\$0.10	1,155,615
Electric	Large Office	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	49,381	7	\$14,910	90%	95%	\$0.07	1,900,454
Electric	Large Office	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	49,381	7	\$14,910	90%	95%	\$0.07	20,701,961
Electric	Large Office	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	39,504	3	\$12,104	95%	50%	\$0.14	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	3,128	10	\$21,666	35%	70%	\$1.18	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	3,128	10	\$21,666	35%	70%	\$1.18	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	12,771	10	\$21,666	35%	70%	\$0.29	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	12,771	10	\$21,666	35%	70%	\$0.29	0.00
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	17,680	25	\$226	15%	90%	\$0.00	136,851
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	17,680	25	\$226	15%	90%	\$0.00	1,491,654
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	21,957	25	\$3,442	15%	25%	\$0.02	36,650
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	21,957	25	\$3,442	15%	25%	\$0.02	399,477

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Heat Pump	Air Source Heat Pump > 240 kBtuh - High Efficiency	High Efficiency - 10.0 EER, 3.3 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	19,467	15	\$18,897	100%	N/A	\$0.13	0.00
Electric	Large Office	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	37,100	15	\$40,200	100%	N/A	\$0.14	126
Electric	Large Office	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	37,100	15	\$40,200	100%	N/A	\$0.14	770
Electric	Large Office	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	12,652	7	\$55,981	95%	95%	\$0.98	0.00
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	13,663	15	\$8,949	35%	95%	\$0.09	25,897
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	13,663	15	\$8,949	35%	95%	\$0.09	25,897
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	25,745	15	\$8,949	35%	95%	\$0.05	411,030
Electric	Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	25,745	15	\$8,949	35%	95%	\$0.05	411,030
Electric	Large Office	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	57,861	5	\$4,728	0.0%	25%	\$0.02	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	19,243	14	\$68,614	5.0%	95%	\$0.49	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	19,243	14	\$68,614	5.0%	95%	\$0.49	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	37,366	14	\$68,614	5.0%	95%	\$0.25	0.00
Electric	Large Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	37,366	14	\$68,614	5.0%	95%	\$0.25	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	13,663	40	\$58,919	2.0%	100%	\$1.68	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	13,663	40	\$58,919	2.0%	100%	\$1.68	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	25,745	40	\$58,919	2.0%	100%	\$0.89	0.00
Electric	Large Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	25,745	40	\$58,919	2.0%	100%	\$0.89	0.00
Electric	Large Office	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump > 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	160,135	30	\$24,728	5.0%	N/A	\$0.73	0.00
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3,268	25	\$6,483	75%	85%	\$0.20	95,438
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3,268	25	\$6,483	75%	85%	\$0.20	95,438
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	6,220	25	\$6,483	75%	85%	\$0.11	19,896
Electric	Large Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	6,220	25	\$6,483	75%	85%	\$0.11	19,896
Electric	Large Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	6,943	20	\$938	45%	85%	\$0.02	13,644
Electric	Large Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	6,943	20	\$938	45%	85%	\$0.02	127,036

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	5,344	25	\$7,413	15%	95%	\$0.14	34,952
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	5,344	25	\$7,413	15%	95%	\$0.14	34,952
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	13,138	25	\$7,413	15%	95%	\$0.06	9,552
Electric	Large Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	13,138	25	\$7,413	15%	95%	\$0.06	9,552
Electric	Large Office	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	5,690	25	\$6,180	95%	85%	\$0.11	22,818
Electric	Large Office	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	5,690	25	\$6,180	95%	85%	\$0.11	218,277
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	3,128	10	\$21,666	0.0%	0%	\$1.18	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	3,128	10	\$21,666	0.0%	0%	\$1.18	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	12,771	10	\$21,666	0.0%	0%	\$0.29	0.00
Electric	Large Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	12,771	10	\$21,666	0.0%	0%	\$0.29	0.00
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	17,263	25	\$226	80%	90%	\$0.00	83,526
Electric	Large Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	17,263	25	\$226	80%	90%	\$0.00	777,674
Electric	Large Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	8,361	8	\$1,089	75%	70%	\$0.03	7,819,204
Electric	Large Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	8,361	8	\$1,089	75%	70%	\$0.03	8,310,180
Electric	Large Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	6,944	15	\$3,774	62%	90%	\$0.07	0.00
Electric	Large Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,970	8	\$5,567	90%	75%	\$0.37	0.00
Electric	Large Office	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	7,085	8	\$1,974	5.0%	50%	\$0.06	0.00
Electric	Large Office	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	13,783	17	\$9,365	75%	50%	\$0.08	0.00
Electric	Large Office	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	2,893	8	\$590	25%	25%	\$0.04	0.00
Electric	Large Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	8,361	8	\$1,089	75%	70%	\$0.03	868,154
Electric	Large Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	8,361	8	\$1,089	75%	70%	\$0.03	1,049,349
Electric	Large Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	6,944	15	\$3,774	62%	90%	\$0.07	0.00
Electric	Large Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	2,970	8	\$5,567	90%	75%	\$0.37	0.00
Electric	Large Office	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	7,085	8	\$1,974	5.0%	50%	\$0.06	0.00
Electric	Large Office	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	13,783	17	\$9,365	75%	50%	\$0.08	0.00
Electric	Large Office	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	5,379	10	\$2,534	75%	75%	\$0.08	0.00
Electric	Large Office	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	15,270	8	\$12,784	30%	80%	\$0.17	0.00
Electric	Large Office	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	11,452	8	\$9,592	30%	80%	\$0.17	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	36,377	13	\$99,231	50%	N/A	\$0.80	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	36,377	13	\$99,231	50%	N/A	\$0.80	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	37,780	13	\$98,793	50%	N/A	\$0.77	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	37,780	13	\$98,793	50%	N/A	\$0.77	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,145	13	\$5,038	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,145	13	\$5,038	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,459	13	\$5,809	100%	N/A	\$0.12	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,459	13	\$5,809	100%	N/A	\$0.12	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	14,970	13	\$10,106	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	14,970	13	\$10,106	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,547	13	\$10,886	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,547	13	\$10,886	100%	N/A	\$0.11	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	16,934	13	\$30,706	100%	N/A	\$0.32	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	16,934	13	\$30,706	100%	N/A	\$0.32	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,587	13	\$33,225	100%	N/A	\$0.33	0.00
Electric	Large Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,587	13	\$33,225	100%	N/A	\$0.33	0.00
Electric	Large Office	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	20,710	8	\$5,567	75%	75%	\$0.05	18,397,252
Electric	Large Office	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	20,710	8	\$5,567	75%	75%	\$0.05	20,305,015
Electric	Large Office	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	20,172	8	\$590	5.0%	25%	\$0.01	478,972

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	20,172	8	\$590	5.0%	25%	\$0.01	528,640
Electric	Large Office	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,832	15	\$1,210	100%	N/A	\$0.10	0.00
Electric	Large Office	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,393	15	\$4,962	95%	N/A	\$0.27	0.00
Electric	Large Office	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,027	25	\$36,455	50%	N/A	\$1.79	0.00
Electric	Large Office	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,233	17	\$52	25%	N/A	-\$0.03	97,217
Electric	Large Office	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,233	17	\$52	25%	N/A	-\$0.03	99,662
Electric	Large Office	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	555	15	\$23,058	100%	N/A	\$5.28	0.00
Electric	Large Office	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	793	8	\$5,567	75%	75%	\$1.40	0.00
Electric	Large Office	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	773	8	\$590	10%	25%	\$0.15	0.00
Electric	Large Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	712	11	\$279	95%	65%	\$0.06	783,906
Electric	Large Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	712	11	\$279	95%	65%	\$0.06	833,067
Electric	Large Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	142	13	\$121	95%	95%	\$0.12	0.00
Electric	Large Office	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	4,561	10	\$2,534	75%	75%	\$0.09	0.00
Electric	Large Office	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	11,330	8	\$12,784	30%	80%	\$0.23	0.00
Electric	Large Office	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	8,497	8	\$9,592	30%	80%	\$0.23	0.00
Electric	Large Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	142	13	\$121	95%	95%	\$0.12	0.00
Electric	Large Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	20,527	13	\$28,845	100%	N/A	\$0.20	0.00
Electric	Large Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	20,527	13	\$28,845	100%	N/A	\$0.20	0.00
Electric	Large Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	25,089	13	\$29,639	100%	N/A	\$0.17	0.00
Electric	Large Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	25,089	13	\$29,639	100%	N/A	\$0.17	0.00
Electric	Large Office	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	17,562	8	\$5,567	75%	75%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	31,414	4	\$287	85%	N/A	\$-0.02	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	31,414	4	\$287	85%	N/A	\$-0.02	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	51,566	4	\$469	85%	N/A	\$-0.02	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	51,566	4	\$469	85%	N/A	\$-0.02	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	26,263	1	\$83	100%	N/A	\$0.01	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	43,110	1	\$143	100%	N/A	\$0.01	0.00
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	31,653	12	\$7,285	85%	N/A	\$0.02	4,767,607
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	31,653	12	\$7,285	85%	N/A	\$0.02	4,767,607
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	51,958	12	\$11,967	85%	N/A	\$0.02	7,641,775
Electric	Large Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	51,958	12	\$11,967	85%	N/A	\$0.02	7,641,775
Electric	Large Office	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,901	8	\$5,567	75%	75%	\$0.38	0.00
Electric	Large Office	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	2,826	8	\$590	1.0%	25%	\$0.04	3,484
Electric	Large Office	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	2,826	8	\$590	1.0%	25%	\$0.04	5,382
Electric	Large Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	12	7	\$7	10%	90%	\$0.13	0.00
Electric	Large Office	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	487	4	\$0.00	75%	45%	\$0.00	0.00
Electric	Large Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	393	10	\$7	95%	75%	\$0.00	580,968
Electric	Large Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	393	10	\$7	95%	75%	\$0.00	632,068
Electric	Large Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	6,082	4	\$1,210	60%	90%	\$0.07	0.00
Electric	Large Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	12	7	\$7	10%	90%	\$0.13	0.00
Electric	Large Office	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	487	4	\$0.00	75%	45%	\$0.00	0.00
Electric	Large Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	393	10	\$7	95%	75%	\$0.00	65,947

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	393	10	\$7	95%	75%	\$0.00	77,879
Electric	Large Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	6,082	4	\$1,210	60%	90%	\$0.07	0.00
Electric	Large Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	860	6	\$1,074	100%	N/A	\$0.31	0.00
Electric	Large Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	860	6	\$1,074	100%	N/A	\$0.31	48
Electric	Large Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	860	6	\$1,074	100%	N/A	\$0.31	73
Electric	Large Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	4,225	6	\$620	100%	N/A	\$0.04	57,095
Electric	Large Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	4,225	6	\$620	100%	N/A	\$0.04	102,286
Electric	Large Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	4,225	6	\$620	100%	N/A	\$0.04	0.00
Electric	Large Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	802	20	\$2,186	100%	N/A	\$0.31	0.00
Electric	Large Office	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	899	20	\$2,927	100%	N/A	\$0.37	0.00
Electric	Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	705	20	\$173	100%	N/A	\$0.03	127,812
Electric	Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	705	20	\$173	100%	N/A	\$0.03	137,288
Electric	Large Office	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	224	20	\$75	100%	N/A	\$0.04	0.00
Electric	Large Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,502	20	\$582	8.8%	100%	\$0.01	660,402
Electric	Large Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,502	20	\$582	8.8%	100%	\$0.01	660,402
Electric	Large Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,614	20	\$559	8.8%	100%	\$0.01	733,140
Electric	Large Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,614	20	\$559	8.8%	100%	\$0.01	733,140
Electric	Large Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	802	20	\$2,186	100%	N/A	\$0.31	0.00
Electric	Large Office	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	899	20	\$2,927	100%	N/A	\$0.37	0.00
Electric	Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	705	20	\$173	100%	N/A	\$0.03	58,752
Electric	Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	705	20	\$173	100%	N/A	\$0.03	60,224
Electric	Large Office	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	224	20	\$75	100%	N/A	\$0.04	0.00
Electric	Large Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	212	15	\$8,949	35%	95%	\$5.52	0.00
Electric	Large Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	269	15	\$8,949	35%	95%	\$4.33	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	388	15	\$78,019	0.5%	65%	\$59.88	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	494	15	\$78,019	0.5%	65%	\$47.03	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	388	15	\$47,033	0.5%	65%	\$49.46	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	494	15	\$47,033	0.5%	65%	\$38.84	0.00
Electric	Large Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	212	40	\$58,919	2.0%	100%	\$108.39	0.00
Electric	Large Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	269	40	\$58,919	2.0%	100%	\$85.13	0.00
Electric	Large Office	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	106	12	\$2,458	10%	60%	\$3.48	866
Electric	Large Office	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	134	12	\$2,458	10%	60%	\$2.73	0.00
Electric	Large Office	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$13,458	45%	65%	\$398.55	134
Electric	Large Office	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4	25	\$13,458	45%	65%	\$313.03	0.00
Electric	Large Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.73	25	\$6,483	25%	85%	\$896.45	0.00
Electric	Large Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.93	25	\$6,483	25%	85%	\$704.10	0.00
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	198	9	\$52	100%	N/A	\$0.05	3,143
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	198	9	\$52	100%	N/A	\$0.05	3,143
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	252	9	\$52	100%	N/A	\$0.04	7,062
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	252	9	\$52	100%	N/A	\$0.04	7,062
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	267	25	\$226	15%	90%	\$0.09	4,906
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	340	25	\$226	15%	90%	\$0.07	3,806
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	244	25	\$3,442	15%	25%	\$1.44	0.00
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	310	25	\$3,442	15%	25%	\$1.13	0.00
Electric	Large Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	212	15	\$8,949	35%	95%	\$5.52	0.00
Electric	Large Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	269	15	\$8,949	35%	95%	\$4.33	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	388	15	\$42,411	0.5%	65%	\$47.90	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	494	15	\$42,411	0.5%	65%	\$37.62	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	388	15	\$17,628	0.5%	65%	\$39.57	0.00
Electric	Large Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	494	15	\$17,628	0.5%	65%	\$31.08	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	212	40	\$58,919	2.0%	100%	\$108.39	0.00
Electric	Large Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	269	40	\$58,919	2.0%	100%	\$85.13	0.00
Electric	Large Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.73	25	\$6,483	75%	85%	\$896.45	0.00
Electric	Large Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.93	25	\$6,483	75%	85%	\$704.10	0.00
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	198	9	\$52	100%	N/A	\$0.05	1,074
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	198	9	\$52	100%	N/A	\$0.05	1,074
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	252	9	\$52	100%	N/A	\$0.04	1,622
Electric	Large Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	252	9	\$52	100%	N/A	\$0.04	1,622
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	267	25	\$226	80%	90%	\$0.09	2,608
Electric	Large Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	340	25	\$226	80%	90%	\$0.07	2,359
Electric	Large Office	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	23,962	15	\$47,093	0.5%	65%	\$0.80	0.00
Electric	Large Office	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,860	12	\$2,458	10%	60%	\$0.10	0.00
Electric	Large Office	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,492	25	\$13,458	45%	65%	\$0.31	0.00
Electric	Large Office	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	962	25	\$6,483	25%	85%	\$0.69	0.00
Electric	Large Office	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9,281	25	\$24,026	15%	85%	\$0.26	0.00
Electric	Large Office	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,727	25	\$7,413	15%	95%	\$0.44	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	4,678	25	\$59,067	10%	45%	\$1.29	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	4,678	25	\$59,067	10%	45%	\$1.29	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	12,274	25	\$59,067	10%	45%	\$0.49	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	12,274	25	\$59,067	10%	45%	\$0.49	0.00
Electric	Large Office	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	23,962	15	\$871	0.5%	65%	\$0.55	0.00
Electric	Large Office	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	962	25	\$6,483	75%	85%	\$0.69	0.00
Electric	Large Office	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,727	25	\$7,413	15%	95%	\$0.44	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	4,678	25	\$6,180	95%	85%	\$0.13	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	4,678	25	\$6,180	95%	85%	\$0.13	0.00
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	12,274	25	\$6,180	95%	85%	\$0.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	12,274	25	\$6,180	95%	85%	\$0.05	0.00
Electric	Large Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	866	9	\$113	100%	N/A	\$0.02	920,897
Electric	Large Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	866	9	\$113	100%	N/A	\$0.02	937,066
Electric	Large Office	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	Existing	2,979	4	\$11,165	10%	65%	\$1.32	0.00
Electric	Large Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	866	9	\$113	100%	N/A	\$0.02	120,068
Electric	Large Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	866	9	\$113	100%	N/A	\$0.02	139,586
Electric	Large Office	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	New	2,968	4	\$11,165	10%	65%	\$1.33	0.00
Electric	Large Office	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	2,819	15	\$4,728	75%	95%	\$0.22	0.00
Electric	Large Office	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	16,914	15	\$29,976	15%	70%	\$1.78	0.00
Electric	Large Office	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	8,457	5	\$4,728	75%	75%	\$0.16	0.00
Electric	Large Office	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	1,409	18	\$18,156	45%	85%	\$1.52	0.00
Electric	Large Office	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	8,457	14	\$68,614	5.0%	95%	\$1.11	0.00
Electric	Large Office	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	5,638	12	\$2,458	10%	60%	\$0.07	0.00
Electric	Large Office	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,562	25	\$13,458	45%	65%	\$0.21	0.00
Electric	Large Office	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,405	25	\$6,483	25%	85%	\$0.47	0.00
Electric	Large Office	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,691	20	\$5,287	45%	60%	\$0.35	0.00
Electric	Large Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	1,014	20	\$938	45%	85%	\$0.10	0.00
Electric	Large Office	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	13,557	25	\$24,026	15%	85%	\$0.18	0.00
Electric	Large Office	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	2,523	25	\$7,413	15%	95%	\$0.30	0.00
Electric	Large Office	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	17,928	25	\$59,067	10%	45%	\$0.34	0.00
Electric	Large Office	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	7,047	7	\$14,910	90%	95%	\$0.47	0.00
Electric	Large Office	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,849	7	\$55,981	95%	95%	\$6.71	0.00
Electric	Large Office	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	8,457	5	\$4,728	0.0%	25%	\$0.16	0.00
Electric	Large Office	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	8,457	14	\$68,614	5.0%	95%	\$1.11	0.00
Electric	Large Office	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,405	25	\$6,483	75%	85%	\$0.47	0.00
Electric	Large Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	1,014	20	\$938	45%	85%	\$0.10	0.00
Electric	Large Office	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	2,523	25	\$7,413	15%	95%	\$0.30	0.00
Electric	Large Office	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	6,834	25	\$6,180	95%	85%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,823	10	\$385	100%	N/A	\$0.02	1,619,519
Electric	Large Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,823	10	\$385	100%	N/A	\$0.02	1,672,703
Electric	Large Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,823	10	\$385	100%	N/A	\$0.02	295,514
Electric	Large Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,823	10	\$385	100%	N/A	\$0.02	342,780
Electric	Large Office	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	35,952	10	\$9,274	5.0%	90%	\$0.04	1,382,505
Electric	Large Office	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	35,952	10	\$9,274	5.0%	90%	\$0.04	1,962,112
Electric	Large Office	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	53,928	15	\$29,976	15%	70%	\$0.56	0.00
Electric	Large Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,833	15	\$499	95%	90%	\$0.04	1,351,433
Electric	Large Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,833	15	\$499	95%	90%	\$0.04	1,918,014
Electric	Large Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	45,839	20	\$8,427	55%	65%	\$0.02	15,543,842
Electric	Large Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	45,839	20	\$8,427	55%	65%	\$0.02	22,060,508
Electric	Large Office	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	1,335	7	\$378	65%	25%	\$0.06	183,817
Electric	Large Office	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	1,335	7	\$378	65%	25%	\$0.06	260,882
Electric	Large Office	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	35,952	10	\$9,274	5.0%	90%	\$0.04	148,696
Electric	Large Office	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	35,952	10	\$9,274	5.0%	90%	\$0.04	271,141
Electric	Large Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,833	15	\$499	95%	90%	\$0.04	141,629
Electric	Large Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,833	15	\$499	95%	90%	\$0.04	259,384
Electric	Large Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	45,839	20	\$8,427	55%	45%	\$0.02	1,068,954

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	45,839	20	\$8,427	55%	45%	\$0.02	1,783,925
Electric	Large Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	870	10	\$21,015	55%	80%	\$4.10	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	13	12	\$37	95%	35%	\$0.41	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	174	12	\$302	75%	75%	\$0.26	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	3,482	25	\$9,403	2.5%	95%	\$0.28	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	672	9	\$7	95%	75%	\$0.00	109,061
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	672	9	\$7	95%	75%	\$0.00	116,451
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	277	9	\$0.00	95%	50%	\$0.00	29,938
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	277	9	\$0.00	95%	50%	\$0.00	31,966
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	104	9	\$22	95%	25%	\$0.04	4,697
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	104	9	\$22	95%	25%	\$0.04	5,016
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$22	95%	85%	\$0.02	34,241
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$22	95%	85%	\$0.02	36,561
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$60	95%	25%	\$0.06	8,122
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$60	95%	25%	\$0.06	8,672
Electric	Large Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	435	10	\$385	75%	85%	\$0.15	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	10,395	15	\$3,782	75%	N/A	\$0.06	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	10,273	15	\$2,261	75%	N/A	\$0.04	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	863	10	\$21,015	55%	80%	\$4.14	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	13	12	\$37	95%	35%	\$0.41	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	3,453	25	\$7,519	2.5%	95%	\$0.22	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	667	9	\$7	95%	75%	\$0.00	8,198
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	667	9	\$7	95%	75%	\$0.00	10,100
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	274	9	\$0.00	95%	50%	\$0.00	2,250

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	274	9	\$0.00	95%	50%	\$0.00	2,772
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$22	95%	85%	\$0.02	2,595
Electric	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$22	95%	85%	\$0.02	3,197
Electric	Large Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	431	10	\$385	75%	85%	\$0.15	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	10,395	15	\$3,782	75%	N/A	\$0.06	0.00
Electric	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	10,273	15	\$2,261	75%	N/A	\$0.04	0.00
Electric	Large Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	909	10	\$21,015	75%	80%	\$3.92	0.00
Electric	Large Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	13	12	\$37	75%	35%	\$0.41	0.00
Electric	Large Office	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	181	12	\$302	75%	75%	\$0.25	0.00
Electric	Large Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	3,639	25	\$9,403	2.5%	95%	\$0.26	0.00
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	703	9	\$7	95%	75%	\$0.00	298,442
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	703	9	\$7	95%	75%	\$0.00	318,667
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	289	9	\$0.00	95%	50%	\$0.00	81,925
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	289	9	\$0.00	95%	50%	\$0.00	87,477
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	109	9	\$22	95%	25%	\$0.04	12,855
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	109	9	\$22	95%	25%	\$0.04	13,727
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$22	95%	85%	\$0.02	89,659
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$22	95%	85%	\$0.02	95,735
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$60	95%	25%	\$0.06	21,267
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$60	95%	25%	\$0.06	22,709
Electric	Large Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	454	10	\$385	75%	85%	\$0.14	0.00
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	9,614	15	\$19,457	75%	N/A	\$0.30	0.00
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	562	15	\$847	100%	N/A	\$0.20	0.00
Electric	Large Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	882	10	\$21,015	75%	80%	\$4.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	13	12	\$37	75%	35%	\$0.41	0.00
Electric	Large Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	3,530	25	\$7,519	2.5%	95%	\$0.22	0.00
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	681	9	\$7	95%	75%	\$0.00	31,041
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	681	9	\$7	95%	75%	\$0.00	38,082
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	280	9	\$0.00	95%	50%	\$0.00	8,521
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	280	9	\$0.00	95%	50%	\$0.00	10,454
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$22	95%	85%	\$0.02	9,613
Electric	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$22	95%	85%	\$0.02	11,794
Electric	Large Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	441	10	\$385	75%	85%	\$0.15	0.00
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	9,614	15	\$19,457	75%	N/A	\$0.30	77
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	9,614	15	\$19,457	75%	N/A	\$0.30	172
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	562	15	\$847	100%	N/A	\$0.20	-132.33732
Electric	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	562	15	\$847	100%	N/A	\$0.20	-14.556492
Electric	Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	1,102	4	\$125	100%	N/A	\$0.04	716,001
Electric	Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	1,102	4	\$125	100%	N/A	\$0.04	783,543
Electric	Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	1,102	4	\$125	100%	N/A	\$0.04	210,375
Electric	Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	1,102	4	\$125	100%	N/A	\$0.04	244,816
Electric	Large Retail	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	16	12	\$8	7.0%	90%	\$0.08	0.00
Electric	Large Retail	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	10	12	\$26	7.0%	70%	\$0.38	0.00
Electric	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	18	12	\$8	7.0%	55%	\$0.07	2,211
Electric	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	18	12	\$8	7.0%	55%	\$0.07	4,868
Electric	Large Retail	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	26	12	\$17	15%	85%	\$0.10	0.00
Electric	Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	44	12	\$22	11%	75%	\$0.08	0.00
Electric	Large Retail	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	16	12	\$8	7.0%	90%	\$0.08	0.00
Electric	Large Retail	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	10	12	\$26	7.0%	70%	\$0.38	0.00
Electric	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	18	12	\$8	7.0%	55%	\$0.07	295

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	18	12	\$8	7.0%	55%	\$0.07	505
Electric	Large Retail	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	26	12	\$17	15%	85%	\$0.10	0.00
Electric	Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	44	12	\$22	11%	75%	\$0.08	0.00
Electric	Large Retail	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	3,469	15	\$594	25%	95%	\$0.02	2,621,230
Electric	Large Retail	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	3,664	15	\$594	25%	95%	\$0.02	2,646,914
Electric	Large Retail	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	64,157	15	\$35,799	15%	70%	\$0.28	0.00
Electric	Large Retail	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	67,773	15	\$35,799	15%	70%	\$0.26	0.00
Electric	Large Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	21,385	15	\$8,902	80%	95%	\$0.05	43,079,557
Electric	Large Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	22,591	15	\$8,902	80%	95%	\$0.05	43,501,676
Electric	Large Retail	Cooling Dx Evap	DX Package 240 to 760 kBtuh - High Efficiency	High Efficiency - 10.5 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	11,945	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Retail	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	18,582	15	\$18,944	100%	N/A	\$0.13	0.00
Electric	Large Retail	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	32,078	10	\$37,992	10%	80%	\$0.20	0.00
Electric	Large Retail	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	33,886	10	\$37,992	10%	80%	\$0.19	0.00
Electric	Large Retail	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	32,078	5	\$2,791	75%	75%	\$0.03	78,022,221
Electric	Large Retail	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	33,886	5	\$2,791	75%	75%	\$0.02	78,786,730
Electric	Large Retail	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	5,346	18	\$10,721	45%	85%	\$0.24	0.00
Electric	Large Retail	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	5,647	18	\$10,721	45%	85%	\$0.22	0.00
Electric	Large Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	150,516	15	-\$128187.9	35%	N/A	-\$0.14	40,530,063
Electric	Large Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	Existing	150,516	15	-\$128187.9	35%	N/A	-\$0.14	42,427,177
Electric	Large Retail	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	9,623	12	\$5,454	2.5%	85%	\$0.09	486,364
Electric	Large Retail	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	10,165	12	\$5,454	2.5%	85%	\$0.08	491,130

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	21,385	40	\$57,653	2.0%	100%	\$1.07	0.00
Electric	Large Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	22,591	40	\$57,653	2.0%	100%	\$1.01	0.00
Electric	Large Retail	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	10,692	12	\$1,250	10%	60%	\$0.02	1,882,898
Electric	Large Retail	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	11,295	12	\$1,250	10%	60%	\$0.02	1,901,348
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	826	25	\$13,396	45%	65%	\$1.65	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	872	25	\$13,396	45%	65%	\$1.56	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	74	25	\$6,441	25%	85%	\$8.83	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	78	25	\$6,441	25%	85%	\$8.36	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,415	20	\$6,088	45%	60%	\$0.11	3,785,396
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,777	20	\$6,088	45%	60%	\$0.10	3,822,488
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	3,849	20	\$1,067	45%	85%	\$0.03	3,929,723
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	4,066	20	\$1,067	45%	85%	\$0.03	3,968,229
Electric	Large Retail	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	26,732	7	\$8,804	90%	95%	\$0.07	67,826,609
Electric	Large Retail	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	28,238	7	\$8,804	90%	95%	\$0.07	68,491,216
Electric	Large Retail	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	21,385	5	\$10,721	95%	50%	\$0.15	0.00
Electric	Large Retail	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	22,591	5	\$10,721	95%	50%	\$0.14	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	6,125	10	\$11,029	35%	70%	\$0.31	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	6,125	10	\$11,029	35%	70%	\$0.31	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,244	10	\$11,029	35%	70%	\$0.20	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,244	10	\$11,029	35%	70%	\$0.20	0.00
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	26,982	25	\$116	15%	90%	\$0.00	13,826,604
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	28,503	25	\$116	15%	90%	\$0.00	13,962,086
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	24,611	25	\$1,751	15%	25%	\$0.01	3,443,488
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	25,998	25	\$1,751	15%	25%	\$0.01	3,477,230
Electric	Large Retail	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	6,843	7	\$33,056	95%	95%	\$1.07	0.00
Electric	Large Retail	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	7,220	7	\$33,056	95%	95%	\$1.02	0.00
Electric	Large Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	20,864	15	\$8,902	80%	95%	\$0.06	3,131,003
Electric	Large Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	22,014	15	\$8,902	80%	95%	\$0.05	4,388,972

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Cooling Dx Evap	DX Package 240 to 760 kBtuh - High Efficiency	High Efficiency - 10.5 EER	Standard Efficiency - 10.0 EER	Per Building	New	11,945	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Retail	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	New	18,582	15	\$15,156	100%	N/A	\$0.11	0.00
Electric	Large Retail	Cooling Dx Evap	DX Package 240 to 760 kBtuh - Premium Efficiency	Premium Efficiency - 10.8 EER	Standard Efficiency - 10.0 EER	Per Building	New	18,582	15	\$15,156	100%	N/A	\$0.11	1,674,065
Electric	Large Retail	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	31,296	5	\$2,791	25%	25%	\$0.03	595,238
Electric	Large Retail	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	33,021	5	\$2,791	25%	25%	\$0.02	837,753
Electric	Large Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	New	150,516	15	-\$97695.477	35%	N/A	-\$0.11	6,305,873
Electric	Large Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 240 to 760 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 10.0 EER	Per Building	New	150,516	15	-\$97695.477	35%	N/A	-\$0.11	19,333,784
Electric	Large Retail	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	9,388	12	\$5,454	2.5%	85%	\$0.09	40,435
Electric	Large Retail	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	9,906	12	\$5,454	2.5%	85%	\$0.08	56,910
Electric	Large Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	20,864	40	\$57,653	2.0%	100%	\$1.10	0.00
Electric	Large Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	22,014	40	\$57,653	2.0%	100%	\$1.04	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	72	25	\$6,441	75%	85%	\$9.05	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	76	25	\$6,441	75%	85%	\$8.58	0.00
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	3,755	20	\$1,067	45%	85%	\$0.03	254,389
Electric	Large Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	3,962	20	\$1,067	45%	85%	\$0.03	391,375
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	6,125	10	\$11,029	0.0%	0%	\$0.31	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	6,125	10	\$11,029	0.0%	0%	\$0.31	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,244	10	\$11,029	0.0%	0%	\$0.20	0.00
Electric	Large Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,244	10	\$11,029	0.0%	0%	\$0.20	0.00
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	26,324	25	\$116	80%	90%	\$0.00	4,717,554
Electric	Large Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	27,775	25	\$116	80%	90%	\$0.00	7,257,902
Electric	Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	47	6	\$4	100%	N/A	\$0.02	229,264
Electric	Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	47	6	\$4	100%	N/A	\$0.02	232,104
Electric	Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	47	6	\$4	100%	N/A	\$0.02	34,633
Electric	Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	47	6	\$4	100%	N/A	\$0.02	40,793
Electric	Large Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	148	4	\$169	100%	N/A	\$0.40	0.00
Electric	Large Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	148	4	\$169	100%	N/A	\$0.40	24

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	148	4	\$169	100%	N/A	\$0.40	34
Electric	Large Retail	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	1	20	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	4	20	\$0.00	100%	N/A	\$0.00	9,421
Electric	Large Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	4	20	\$0.00	100%	N/A	\$0.00	-172.551852
Electric	Large Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	33	20	\$4	8.8%	100%	\$0.02	20,514
Electric	Large Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	33	20	\$4	8.8%	100%	\$0.02	20,514
Electric	Large Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	39	20	\$4	8.8%	100%	\$0.01	22,505
Electric	Large Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	39	20	\$4	8.8%	100%	\$0.01	22,505
Electric	Large Retail	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	1	20	\$0.00	100%	N/A	\$0.00	0.00
Electric	Large Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	4	20	\$0.00	100%	N/A	\$0.00	3,269
Electric	Large Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	4	20	\$0.00	100%	N/A	\$0.00	-22.405452
Electric	Large Retail	Heat Pump	Air Source Heat Pump > 240 kBtuh - High Efficiency	High Efficiency - 10.0 EER, 3.3 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	12,739	15	\$20,928	100%	N/A	\$0.21	0.00
Electric	Large Retail	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	24,274	15	\$44,514	100%	N/A	\$0.24	0.00
Electric	Large Retail	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	4,797	15	\$594	25%	95%	\$0.02	0.00
Electric	Large Retail	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	4,797	15	\$594	25%	95%	\$0.02	651,814
Electric	Large Retail	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	79,463	15	\$35,799	15%	70%	\$0.22	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	11,919	15	\$8,902	80%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	11,919	15	\$8,902	80%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	16,161	15	\$8,902	80%	95%	\$0.07	5,102,009
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	16,161	15	\$8,902	80%	95%	\$0.07	5,102,009
Electric	Large Retail	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	39,731	5	\$2,791	75%	75%	\$0.02	0.00
Electric	Large Retail	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	39,731	5	\$2,791	75%	75%	\$0.02	17,369,872

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	6,621	18	\$10,721	45%	85%	\$0.19	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	15,489	14	\$40,516	5.0%	95%	\$0.36	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	15,489	14	\$40,516	5.0%	95%	\$0.36	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	21,852	14	\$40,516	5.0%	95%	\$0.25	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	21,852	14	\$40,516	5.0%	95%	\$0.25	0.00
Electric	Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	11,919	12	\$5,454	2.5%	85%	\$0.07	0.00
Electric	Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	11,919	12	\$5,454	2.5%	85%	\$0.07	114,505
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	11,919	40	\$57,653	2.0%	100%	\$1.92	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	11,919	40	\$57,653	2.0%	100%	\$1.92	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	16,161	40	\$57,653	2.0%	100%	\$1.42	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	16,161	40	\$57,653	2.0%	100%	\$1.42	0.00
Electric	Large Retail	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump > 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	Existing	104,989	30	\$55,988	5.0%	N/A	\$1.23	0.00
Electric	Large Retail	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	19,865	12	\$1,250	10%	60%	\$0.01	0.00
Electric	Large Retail	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	19,865	12	\$1,250	10%	60%	\$0.01	797,478
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	20,697	25	\$13,396	45%	65%	\$0.07	2,884,213
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	20,697	25	\$13,396	45%	65%	\$0.07	2,884,213
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	28,779	25	\$13,396	45%	65%	\$0.05	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	28,779	25	\$13,396	45%	65%	\$0.05	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	2,614	25	\$6,441	25%	85%	\$0.25	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	2,614	25	\$6,441	25%	85%	\$0.25	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	3,651	25	\$6,441	25%	85%	\$0.18	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	3,651	25	\$6,441	25%	85%	\$0.18	0.00
Electric	Large Retail	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	7,946	20	\$6,088	45%	60%	\$0.09	0.00
Electric	Large Retail	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	7,946	20	\$6,088	45%	60%	\$0.09	849,876
Electric	Large Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	4,767	20	\$1,067	45%	85%	\$0.03	0.00
Electric	Large Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	4,767	20	\$1,067	45%	85%	\$0.03	874,863

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	23,692	25	\$23,907	15%	85%	\$0.10	1,186,900
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	23,692	25	\$23,907	15%	85%	\$0.10	1,186,900
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	37,852	25	\$23,907	15%	85%	\$0.06	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	37,852	25	\$23,907	15%	85%	\$0.06	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	4,648	25	\$7,375	15%	95%	\$0.16	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	4,648	25	\$7,375	15%	95%	\$0.16	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	7,385	25	\$7,375	15%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	7,385	25	\$7,375	15%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	42,245	25	\$58,778	10%	45%	\$0.14	0.00
Electric	Large Retail	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	33,109	7	\$8,804	90%	95%	\$0.06	0.00
Electric	Large Retail	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	33,109	7	\$8,804	90%	95%	\$0.06	15,968,541
Electric	Large Retail	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	26,487	3	\$10,721	95%	50%	\$0.18	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	2,756	10	\$11,029	35%	70%	\$0.68	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	2,756	10	\$11,029	35%	70%	\$0.68	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	5,640	10	\$11,029	35%	70%	\$0.33	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	5,640	10	\$11,029	35%	70%	\$0.33	0.00
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	16,416	25	\$116	15%	90%	\$0.00	0.00
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	16,416	25	\$116	15%	90%	\$0.00	1,499,094
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	18,056	25	\$1,751	15%	25%	\$0.01	0.00
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	18,056	25	\$1,751	15%	25%	\$0.01	454,179
Electric	Large Retail	Heat Pump	Air Source Heat Pump > 240 kBtuh - High Efficiency	High Efficiency - 10.0 EER, 3.3 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	12,739	15	\$16,742	100%	N/A	\$0.17	0.00
Electric	Large Retail	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	24,274	15	\$35,611	100%	N/A	\$0.19	533
Electric	Large Retail	Heat Pump	Air Source Heat Pump > 240 kBtuh - Premium Efficiency	Premium Efficiency - 10.5 EER, 3.4 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	24,274	15	\$35,611	100%	N/A	\$0.19	0.00
Electric	Large Retail	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	8,426	7	\$33,056	95%	95%	\$0.87	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	11,560	15	\$8,902	80%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	11,560	15	\$8,902	80%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	15,674	15	\$8,902	80%	95%	\$0.07	616,472
Electric	Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	15,674	15	\$8,902	80%	95%	\$0.07	616,472

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	38,535	5	\$2,791	25%	25%	\$0.02	0.00
Electric	Large Retail	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	38,535	5	\$2,791	25%	25%	\$0.02	193,039
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	15,022	14	\$40,516	5.0%	95%	\$0.37	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	15,022	14	\$40,516	5.0%	95%	\$0.37	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	21,194	14	\$40,516	5.0%	95%	\$0.26	0.00
Electric	Large Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	21,194	14	\$40,516	5.0%	95%	\$0.26	0.00
Electric	Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	11,560	12	\$5,454	2.5%	85%	\$0.07	0.00
Electric	Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	11,560	12	\$5,454	2.5%	85%	\$0.07	14,192
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	11,560	40	\$57,653	2.0%	100%	\$1.98	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	11,560	40	\$57,653	2.0%	100%	\$1.98	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	15,674	40	\$57,653	2.0%	100%	\$1.46	0.00
Electric	Large Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	15,674	40	\$57,653	2.0%	100%	\$1.46	0.00
Electric	Large Retail	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump > 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 9.5 EER, 3.2 COP	Per Building	New	104,989	30	\$84,790	5.0%	N/A	\$0.99	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	2,536	25	\$6,441	75%	85%	\$0.26	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	2,536	25	\$6,441	75%	85%	\$0.26	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3,541	25	\$6,441	75%	85%	\$0.19	0.00
Electric	Large Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3,541	25	\$6,441	75%	85%	\$0.19	0.00
Electric	Large Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	4,624	20	\$1,067	45%	85%	\$0.03	0.00
Electric	Large Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	4,624	20	\$1,067	45%	85%	\$0.03	90,182
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	4,508	25	\$7,375	15%	95%	\$0.17	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	4,508	25	\$7,375	15%	95%	\$0.17	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	7,162	25	\$7,375	15%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	7,162	25	\$7,375	15%	95%	\$0.10	0.00
Electric	Large Retail	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	3,789	25	\$6,146	95%	85%	\$0.17	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	2,756	10	\$11,029	0.0%	0%	\$0.68	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	2,756	10	\$11,029	0.0%	0%	\$0.68	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	5,640	10	\$11,029	0.0%	0%	\$0.33	0.00
Electric	Large Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	5,640	10	\$11,029	0.0%	0%	\$0.33	0.00
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	15,921	25	\$116	80%	90%	\$0.00	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	15,921	25	\$116	80%	90%	\$0.00	781,752
Electric	Large Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	10,745	8	\$1,085	75%	70%	\$0.02	39,541,448
Electric	Large Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	10,745	8	\$1,085	75%	70%	\$0.02	41,567,929
Electric	Large Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	8,925	15	\$9,447	62%	90%	\$0.14	0.00
Electric	Large Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	4,512	8	\$6,401	45%	90%	\$0.28	0.00
Electric	Large Retail	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	4,184	8	\$1,165	5.0%	50%	\$0.06	0.00
Electric	Large Retail	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	8,139	17	\$5,530	75%	50%	\$0.08	0.00
Electric	Large Retail	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	3,718	8	\$804	25%	25%	\$0.04	0.00
Electric	Large Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	10,745	8	\$1,085	75%	70%	\$0.02	4,342,553
Electric	Large Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	10,745	8	\$1,085	75%	70%	\$0.02	5,306,526
Electric	Large Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	8,925	15	\$9,447	62%	90%	\$0.14	0.00
Electric	Large Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	4,512	8	\$6,401	45%	90%	\$0.28	0.00
Electric	Large Retail	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	4,184	8	\$1,165	5.0%	50%	\$0.06	0.00
Electric	Large Retail	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	8,139	17	\$5,530	75%	50%	\$0.08	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	5,485	10	\$2,912	5.0%	75%	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	14,497	8	\$12,758	5.0%	85%	\$0.18	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	10,873	8	\$9,568	5.0%	85%	\$0.18	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	846	6	\$312	10%	80%	\$0.07	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	634	6	\$321	5.0%	80%	\$0.11	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	36,894	13	\$81,574	50%	N/A	\$0.71	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	36,894	13	\$81,574	50%	N/A	\$0.71	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	37,428	13	\$85,960	50%	N/A	\$0.72	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	37,428	13	\$85,960	50%	N/A	\$0.72	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,260	13	\$3,292	100%	N/A	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,260	13	\$3,292	100%	N/A	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,380	13	\$3,229	100%	N/A	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	8,380	13	\$3,229	100%	N/A	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,402	13	\$26,177	100%	N/A	\$0.28	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,402	13	\$26,177	100%	N/A	\$0.28	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,175	13	\$26,047	100%	N/A	\$0.25	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,175	13	\$26,047	100%	N/A	\$0.25	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,182	13	\$11,230	100%	N/A	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	15,182	13	\$11,230	100%	N/A	\$0.09	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,423	13	\$11,341	100%	N/A	\$0.08	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	17,423	13	\$11,341	100%	N/A	\$0.08	0.00
Electric	Large Retail	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	24,959	8	\$6,401	5.0%	90%	\$0.05	7,005,653
Electric	Large Retail	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	24,959	8	\$6,401	5.0%	90%	\$0.05	7,470,827
Electric	Large Retail	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	20,571	8	\$804	5.0%	25%	\$0.01	1,605,363
Electric	Large Retail	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	20,571	8	\$804	5.0%	25%	\$0.01	1,711,959
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	8,719	15	\$3,676	100%	N/A	\$0.07	0.00
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	11,388	15	\$15,183	95%	N/A	\$0.17	0.00
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	9,648	16	\$11,860	50%	N/A	\$1.42	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	5,868	11	\$111	25%	N/A	\$-0.03	1,726,375
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	5,868	11	\$111	25%	N/A	\$-0.03	1,751,321
Electric	Large Retail	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,643	15	\$70,745	100%	N/A	\$3.35	0.00
Electric	Large Retail	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	4,399	8	\$6,401	5.0%	90%	\$0.29	0.00
Electric	Large Retail	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	3,625	8	\$804	10%	25%	\$0.04	658,418
Electric	Large Retail	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	3,625	8	\$804	10%	25%	\$0.04	692,111
Electric	Large Retail	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	3,078	11	\$1,197	95%	65%	\$0.06	0.00
Electric	Large Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	615	13	\$527	95%	95%	\$0.12	0.00
Electric	Large Retail	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	6,262	10	\$2,912	5.0%	75%	\$0.08	0.00
Electric	Large Retail	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	11,530	8	\$12,758	5.0%	85%	\$0.22	0.00
Electric	Large Retail	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	8,648	8	\$9,568	5.0%	85%	\$0.22	0.00
Electric	Large Retail	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	654	6	\$160	10%	80%	\$0.03	40,325
Electric	Large Retail	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	654	6	\$160	10%	80%	\$0.03	49,281
Electric	Large Retail	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	361	6	\$142	10%	80%	\$0.07	0.00
Electric	Large Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	615	13	\$527	95%	95%	\$0.12	0.00
Electric	Large Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	40,705	13	\$92,049	100%	N/A	\$0.32	0.00
Electric	Large Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	40,705	13	\$92,049	100%	N/A	\$0.32	0.00
Electric	Large Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	46,967	13	\$82,668	100%	N/A	\$0.25	0.00
Electric	Large Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	46,967	13	\$82,668	100%	N/A	\$0.25	0.00
Electric	Large Retail	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	28,493	8	\$6,401	5.0%	90%	\$0.04	986,709
Electric	Large Retail	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	28,493	8	\$6,401	5.0%	90%	\$0.04	1,205,856

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	57,736	4	\$339	85%	N/A	\$-0.02	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	57,736	4	\$339	85%	N/A	\$-0.02	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	86,533	4	\$509	85%	N/A	\$-0.02	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	86,533	4	\$509	85%	N/A	\$-0.02	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	48,269	1	\$107	100%	N/A	\$0.01	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	72,343	1	\$156	100%	N/A	\$0.01	0.00
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	58,175	12	\$8,648	85%	N/A	\$0.01	37,708,758
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	58,175	12	\$8,648	85%	N/A	\$0.01	37,708,758
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	87,191	12	\$12,959	85%	N/A	\$0.01	55,735,129
Electric	Large Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	87,191	12	\$12,959	85%	N/A	\$0.01	55,735,129
Electric	Large Retail	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	6,885	8	\$6,401	5.0%	90%	\$0.19	0.00
Electric	Large Retail	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	5,674	8	\$804	1.0%	25%	\$0.03	24,925
Electric	Large Retail	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	5,674	8	\$804	1.0%	25%	\$0.03	35,538
Electric	Large Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Large Retail	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	72	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Large Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	53	10	\$0.00	95%	75%	\$0.00	313,043
Electric	Large Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	53	10	\$0.00	95%	75%	\$0.00	336,879
Electric	Large Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	700	4	\$138	60%	90%	\$0.07	0.00
Electric	Large Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	15	7	\$4	10%	90%	\$0.06	0.00
Electric	Large Retail	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	72	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Large Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	53	10	\$0.00	95%	75%	\$0.00	35,148

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	53	10	\$0.00	95%	75%	\$0.00	41,963
Electric	Large Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	700	4	\$138	60%	90%	\$0.07	0.00
Electric	Large Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	128	6	\$160	100%	N/A	\$0.31	0.00
Electric	Large Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	128	6	\$160	100%	N/A	\$0.31	28
Electric	Large Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	128	6	\$160	100%	N/A	\$0.31	43
Electric	Large Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	267	6	\$40	100%	N/A	\$0.04	14,051
Electric	Large Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	267	6	\$40	100%	N/A	\$0.04	25,449
Electric	Large Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	267	6	\$40	100%	N/A	\$0.04	0.00
Electric	Large Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	59	20	\$160	100%	N/A	\$0.30	0.00
Electric	Large Retail	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	66	20	\$214	100%	N/A	\$0.36	0.00
Electric	Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	52	20	\$8	100%	N/A	\$0.02	36,902
Electric	Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	52	20	\$8	100%	N/A	\$0.02	40,073
Electric	Large Retail	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	16	20	\$4	100%	N/A	\$0.03	0.00
Electric	Large Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	408	20	\$44	8.8%	100%	\$0.01	192,767
Electric	Large Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	408	20	\$44	8.8%	100%	\$0.01	192,767
Electric	Large Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	416	20	\$40	8.8%	100%	\$0.01	211,674
Electric	Large Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	416	20	\$40	8.8%	100%	\$0.01	211,674
Electric	Large Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	59	20	\$160	100%	N/A	\$0.30	0.00
Electric	Large Retail	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	66	20	\$214	100%	N/A	\$0.36	0.00
Electric	Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	52	20	\$8	100%	N/A	\$0.02	17,149
Electric	Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	52	20	\$8	100%	N/A	\$0.02	17,388
Electric	Large Retail	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	16	20	\$4	100%	N/A	\$0.03	0.00
Electric	Large Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	225	15	\$8,902	80%	95%	\$5.16	0.00
Electric	Large Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	287	15	\$8,902	80%	95%	\$4.05	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	413	15	\$57,675	0.5%	65%	\$49.83	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	526	15	\$57,675	0.5%	65%	\$39.14	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	413	15	\$30,229	0.5%	65%	\$41.15	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	526	15	\$30,229	0.5%	65%	\$32.32	0.00
Electric	Large Retail	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	101	12	\$5,454	2.5%	85%	\$8.06	0.00
Electric	Large Retail	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	129	12	\$5,454	2.5%	85%	\$6.33	0.00
Electric	Large Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	225	40	\$57,653	2.0%	100%	\$101.33	0.00
Electric	Large Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	287	40	\$57,653	2.0%	100%	\$79.59	0.00
Electric	Large Retail	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	112	12	\$1,250	10%	60%	\$1.66	0.00
Electric	Large Retail	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	143	12	\$1,250	10%	60%	\$1.31	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8	25	\$13,396	45%	65%	\$156.54	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	11	25	\$13,396	45%	65%	\$122.95	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.78	25	\$6,441	25%	85%	\$836.78	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.99	25	\$6,441	25%	85%	\$657.23	0.00
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	210	9	\$49	100%	N/A	\$0.04	25,686
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	210	9	\$49	100%	N/A	\$0.04	25,686
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	268	9	\$49	100%	N/A	\$0.03	23,828
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	268	9	\$49	100%	N/A	\$0.03	23,828
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	284	25	\$116	15%	90%	\$0.04	40,047
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	362	25	\$116	15%	90%	\$0.03	12,842
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	259	25	\$1,751	15%	25%	\$0.69	0.00
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	330	25	\$1,751	15%	25%	\$0.54	0.00
Electric	Large Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	225	15	\$8,902	80%	95%	\$5.16	0.00
Electric	Large Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	287	15	\$8,902	80%	95%	\$4.05	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	413	15	\$26,137	0.5%	65%	\$39.86	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	526	15	\$26,137	0.5%	65%	\$31.31	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	413	15	\$4,186	0.5%	65%	\$32.92	0.00
Electric	Large Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	526	15	\$4,186	0.5%	65%	\$25.86	0.00
Electric	Large Retail	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	101	12	\$5,454	2.5%	85%	\$8.06	0.00
Electric	Large Retail	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	129	12	\$5,454	2.5%	85%	\$6.33	0.00
Electric	Large Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	225	40	\$57,653	2.0%	100%	\$101.33	0.00
Electric	Large Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	287	40	\$57,653	2.0%	100%	\$79.59	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.78	25	\$6,441	75%	85%	\$836.78	0.00
Electric	Large Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.99	25	\$6,441	75%	85%	\$657.23	0.00
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	210	9	\$49	100%	N/A	\$0.04	8,744
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	210	9	\$49	100%	N/A	\$0.04	8,744
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	268	9	\$49	100%	N/A	\$0.03	5,475
Electric	Large Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	268	9	\$49	100%	N/A	\$0.03	5,475
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	284	25	\$116	80%	90%	\$0.04	21,229
Electric	Large Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	362	25	\$116	80%	90%	\$0.03	7,959
Electric	Large Retail	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	3,894	15	\$30,287	0.5%	65%	\$4.37	0.00
Electric	Large Retail	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	282	12	\$5,454	2.5%	85%	\$2.90	0.00
Electric	Large Retail	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	627	12	\$1,250	10%	60%	\$0.30	0.00
Electric	Large Retail	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,234	25	\$13,396	45%	65%	\$1.11	0.00
Electric	Large Retail	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	156	25	\$6,441	25%	85%	\$4.20	0.00
Electric	Large Retail	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,508	25	\$23,907	15%	85%	\$1.61	0.00
Electric	Large Retail	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	280	25	\$7,375	15%	95%	\$2.68	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	760	25	\$58,778	10%	45%	\$7.87	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	760	25	\$58,778	10%	45%	\$7.87	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,994	25	\$58,778	10%	45%	\$3.00	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,994	25	\$58,778	10%	45%	\$3.00	0.00
Electric	Large Retail	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	3,894	15	\$89,342	0.5%	65%	\$3.00	0.00
Electric	Large Retail	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	282	12	\$5,454	2.5%	85%	\$2.90	0.00
Electric	Large Retail	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	156	25	\$6,441	75%	85%	\$4.20	0.00
Electric	Large Retail	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	280	25	\$7,375	15%	95%	\$2.68	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	760	25	\$6,146	95%	85%	\$0.82	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	760	25	\$6,146	95%	85%	\$0.82	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,994	25	\$6,146	95%	85%	\$0.31	0.00
Electric	Large Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,994	25	\$6,146	95%	85%	\$0.31	0.00
Electric	Large Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	168	9	\$22	100%	N/A	\$0.02	704,904
Electric	Large Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	168	9	\$22	100%	N/A	\$0.02	709,490
Electric	Large Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	168	9	\$22	100%	N/A	\$0.02	90,908
Electric	Large Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	168	9	\$22	100%	N/A	\$0.02	106,846
Electric	Large Retail	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	488	15	\$594	25%	95%	\$0.16	0.00
Electric	Large Retail	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	7,322	15	\$35,799	15%	70%	\$2.43	0.00
Electric	Large Retail	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	3,661	5	\$2,791	75%	75%	\$0.22	0.00
Electric	Large Retail	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	610	18	\$10,721	45%	85%	\$2.08	0.00
Electric	Large Retail	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,661	14	\$40,516	5.0%	95%	\$1.51	0.00
Electric	Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,098	12	\$5,454	2.5%	85%	\$0.75	0.00
Electric	Large Retail	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	2,440	12	\$1,250	10%	60%	\$0.08	0.00
Electric	Large Retail	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,801	25	\$13,396	45%	65%	\$0.28	0.00
Electric	Large Retail	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	608	25	\$6,441	25%	85%	\$1.08	0.00
Electric	Large Retail	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	732	20	\$6,088	45%	60%	\$0.93	0.00
Electric	Large Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	439	20	\$1,067	45%	85%	\$0.27	0.00
Electric	Large Retail	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	5,869	25	\$23,907	15%	85%	\$0.41	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,092	25	\$7,375	15%	95%	\$0.69	0.00
Electric	Large Retail	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	7,761	25	\$58,778	10%	45%	\$0.77	0.00
Electric	Large Retail	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	3,050	7	\$8,804	90%	95%	\$0.64	0.00
Electric	Large Retail	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	800	7	\$33,056	95%	95%	\$9.16	0.00
Electric	Large Retail	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	3,661	5	\$2,791	25%	25%	\$0.22	0.00
Electric	Large Retail	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,661	14	\$40,516	5.0%	95%	\$1.51	0.00
Electric	Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,098	12	\$5,454	2.5%	85%	\$0.75	0.00
Electric	Large Retail	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	608	25	\$6,441	75%	85%	\$1.08	0.00
Electric	Large Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	439	20	\$1,067	45%	85%	\$0.27	0.00
Electric	Large Retail	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,092	25	\$7,375	15%	95%	\$0.69	0.00
Electric	Large Retail	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,958	25	\$6,146	95%	85%	\$0.21	0.00
Electric	Large Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	957	10	\$129	100%	N/A	\$0.02	2,136,344
Electric	Large Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	957	10	\$129	100%	N/A	\$0.02	2,230,725
Electric	Large Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	957	10	\$129	100%	N/A	\$0.02	389,819
Electric	Large Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	957	10	\$129	100%	N/A	\$0.02	457,133
Electric	Large Retail	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	20,363	10	\$5,476	5.0%	90%	\$0.05	4,392,143
Electric	Large Retail	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	20,363	10	\$5,476	5.0%	90%	\$0.05	4,534,866
Electric	Large Retail	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	30,545	15	\$35,799	15%	70%	\$0.58	0.00
Electric	Large Retail	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	466	18	\$1,121	95%	65%	\$0.28	0.00
Electric	Large Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,038	15	\$294	95%	90%	\$0.04	4,293,430
Electric	Large Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	1,038	15	\$294	95%	90%	\$0.04	4,432,945

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	25,963	20	\$4,976	55%	65%	\$0.02	49,381,934
Electric	Large Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	25,963	20	\$4,976	55%	65%	\$0.02	50,986,599
Electric	Large Retail	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	788	7	\$223	65%	25%	\$0.06	0.00
Electric	Large Retail	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	20,363	10	\$5,476	5.0%	90%	\$0.05	472,399
Electric	Large Retail	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	20,363	10	\$5,476	5.0%	90%	\$0.05	626,665
Electric	Large Retail	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	466	18	\$1,121	95%	65%	\$0.28	0.00
Electric	Large Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,038	15	\$294	95%	90%	\$0.04	449,948
Electric	Large Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	1,038	15	\$294	95%	90%	\$0.04	599,494
Electric	Large Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	25,963	20	\$4,976	55%	45%	\$0.02	3,396,010
Electric	Large Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	25,963	20	\$4,976	55%	45%	\$0.02	4,123,036
Electric	Large Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1,157	10	\$12,409	75%	95%	\$1.82	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	24	12	\$67	75%	35%	\$0.41	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	24	12	\$13	20%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	24	12	\$13	20%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	20	12	\$8	20%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	20	12	\$8	20%	95%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	231	12	\$142	75%	75%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	4,629	25	\$4,400	2.5%	95%	\$0.10	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	894	9	\$0.00	95%	75%	\$0.00	394,211
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	894	9	\$0.00	95%	75%	\$0.00	416,358
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	368	9	\$0.00	95%	50%	\$0.00	108,214
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	368	9	\$0.00	95%	50%	\$0.00	114,294
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	138	9	\$26	95%	25%	\$0.04	16,981
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	138	9	\$26	95%	25%	\$0.04	17,935
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	17	4	\$4	95%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	578	10	\$393	75%	85%	\$0.12	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	13,819	15	\$1,777	75%	N/A	\$0.02	43,160
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	13,819	15	\$1,777	75%	N/A	\$0.02	43,951
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	13,657	15	\$1,063	75%	N/A	\$0.02	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1,147	10	\$12,409	75%	95%	\$1.84	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	24	12	\$67	75%	35%	\$0.41	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	22	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	23	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	23	12	\$13	20%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	20	12	\$8	20%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	20	12	\$8	20%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	21	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	21	12	\$13	20%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	4,591	25	\$3,515	2.5%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	886	9	\$0.00	95%	75%	\$0.00	31,999
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	886	9	\$0.00	95%	75%	\$0.00	39,672
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	365	9	\$0.00	95%	50%	\$0.00	8,784
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	365	9	\$0.00	95%	50%	\$0.00	10,890
Electric	Large Retail	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	17	4	\$4	95%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	573	10	\$393	75%	85%	\$0.12	0.00
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	13,819	15	\$1,777	75%	N/A	\$0.02	6,530
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	13,819	15	\$1,777	75%	N/A	\$0.02	8,011
Electric	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	13,657	15	\$1,063	75%	N/A	\$0.02	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1,209	10	\$12,409	25%	95%	\$1.74	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	24	12	\$67	75%	35%	\$0.41	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	0.0%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	24	12	\$13	0.0%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	24	12	\$13	0.0%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	20	12	\$8	0.0%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	20	12	\$8	0.0%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	22	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	241	12	\$142	75%	75%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	4,837	25	\$4,400	2.5%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	934	9	\$0.00	95%	75%	\$0.00	2,437,135
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	934	9	\$0.00	95%	75%	\$0.00	2,574,037
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	384	9	\$0.00	95%	50%	\$0.00	669,017
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	384	9	\$0.00	95%	50%	\$0.00	706,598
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	145	9	\$26	95%	25%	\$0.03	104,983
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	145	9	\$26	95%	25%	\$0.03	110,880
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	17	4	\$4	95%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	604	10	\$393	75%	85%	\$0.11	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	12,780	15	\$9,103	75%	N/A	\$0.10	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	747	15	\$397	100%	N/A	\$0.07	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1,173	10	\$12,409	25%	95%	\$1.80	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	24	12	\$67	75%	35%	\$0.41	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	22	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	22	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	23	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	23	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	20	12	\$8	0.0%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	20	12	\$8	0.0%	95%	\$0.07	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	21	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	21	12	\$13	0.0%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	4,693	25	\$3,515	2.5%	95%	\$0.08	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	906	9	\$0.00	95%	75%	\$0.00	250,736
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	906	9	\$0.00	95%	75%	\$0.00	310,988
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	373	9	\$0.00	95%	50%	\$0.00	68,829
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	373	9	\$0.00	95%	50%	\$0.00	85,369
Electric	Large Retail	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	17	4	\$4	95%	95%	\$0.09	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	586	10	\$393	75%	85%	\$0.11	0.00
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	12,780	15	\$9,103	75%	N/A	\$0.10	634
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	12,780	15	\$9,103	75%	N/A	\$0.10	1,427
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	747	15	\$397	100%	N/A	\$0.07	-1093.7955
Electric	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	747	15	\$397	100%	N/A	\$0.07	-118.974816
Electric	Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	500	4	\$58	100%	N/A	\$0.04	384,100

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	500	4	\$58	100%	N/A	\$0.04	419,977
Electric	Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	500	4	\$58	100%	N/A	\$0.04	112,856
Electric	Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	500	4	\$58	100%	N/A	\$0.04	131,220
Electric	Lodging	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	113	12	\$66	19%	60%	\$0.09	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	65	12	\$15	19%	55%	\$0.04	28,359
Electric	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	65	12	\$15	19%	55%	\$0.04	43,027
Electric	Lodging	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	184	12	\$117	55%	85%	\$0.10	0.00
Electric	Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	319	12	\$178	11%	75%	\$0.08	0.00
Electric	Lodging	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	113	12	\$66	19%	60%	\$0.09	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	13	12	\$35	19%	70%	\$0.39	0.00
Electric	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	65	12	\$15	19%	55%	\$0.04	3,790
Electric	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	65	12	\$15	19%	55%	\$0.04	4,469
Electric	Lodging	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	184	12	\$117	55%	85%	\$0.10	0.00
Electric	Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	319	12	\$178	11%	75%	\$0.08	0.00
Electric	Lodging	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	786	15	\$509	50%	95%	\$0.08	153,669
Electric	Lodging	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	786	15	\$509	50%	95%	\$0.08	370,864
Electric	Lodging	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	2,442	10	\$20,017	25%	95%	\$1.39	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	2,442	10	\$20,017	25%	95%	\$1.39	0.00
Electric	Lodging	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	1,615	10	\$17,339	75%	95%	\$1.82	0.00
Electric	Lodging	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	1,615	10	\$17,339	75%	95%	\$1.82	0.00
Electric	Lodging	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	1,615	15	\$46,473	45%	30%	\$3.76	0.00
Electric	Lodging	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	1,615	15	\$46,473	45%	30%	\$3.76	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	238	15	\$552	90%	90%	\$0.30	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	238	15	\$552	90%	90%	\$0.30	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	241	15	\$557	90%	90%	\$0.30	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	241	15	\$557	90%	90%	\$0.30	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	142	15	\$254	75%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	142	15	\$254	75%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	144	15	\$259	75%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	144	15	\$259	75%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	6,777	20	\$14,906	100%	N/A	\$0.25	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	2,259	20	\$4,970	100%	N/A	\$0.25	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	5,039	20	\$11,083	100%	N/A	\$0.25	0.00
Electric	Lodging	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	9,693	15	\$77,371	5.0%	70%	\$1.04	0.00
Electric	Lodging	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	9,693	15	\$77,371	5.0%	70%	\$1.04	0.00
Electric	Lodging	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,231	15	\$4,774	45%	95%	\$0.19	0.00
Electric	Lodging	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,231	15	\$4,774	45%	95%	\$0.19	0.00
Electric	Lodging	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	2,584	7	\$2,473	10%	95%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	2,584	7	\$2,473	10%	95%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	4,523	15	\$221	65%	35%	\$0.01	599,599

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	4,523	15	\$221	65%	35%	\$0.01	1,447,067
Electric	Lodging	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	1,292	13	\$1,791	75%	75%	\$0.20	0.00
Electric	Lodging	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	1,292	13	\$1,791	75%	75%	\$0.20	0.00
Electric	Lodging	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	4,846	5	\$1,590	75%	75%	\$0.10	0.00
Electric	Lodging	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	4,846	5	\$1,590	75%	75%	\$0.10	0.00
Electric	Lodging	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,454	12	\$5,449	10%	85%	\$0.56	0.00
Electric	Lodging	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,454	12	\$5,449	10%	85%	\$0.56	0.00
Electric	Lodging	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,231	40	\$38,211	2.0%	100%	\$3.80	0.00
Electric	Lodging	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,231	40	\$38,211	2.0%	100%	\$3.80	0.00
Electric	Lodging	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,615	12	\$1,356	10%	60%	\$0.13	0.00
Electric	Lodging	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,615	12	\$1,356	10%	60%	\$0.13	0.00
Electric	Lodging	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	52	25	\$7,184	45%	65%	\$13.96	0.00
Electric	Lodging	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	52	25	\$7,184	45%	65%	\$13.96	0.00
Electric	Lodging	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	11	25	\$3,456	25%	85%	\$31.36	0.00
Electric	Lodging	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	11	25	\$3,456	25%	85%	\$31.36	0.00
Electric	Lodging	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,038	7	\$5,016	90%	95%	\$0.28	0.00
Electric	Lodging	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,038	7	\$5,016	90%	95%	\$0.28	0.00
Electric	Lodging	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	3,231	3	\$2	95%	20%	\$0.00	370,934
Electric	Lodging	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	3,231	3	\$2	95%	20%	\$0.00	895,210
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	9,823	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	9,823	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	9,855	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	9,855	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,076	25	\$127	15%	90%	\$0.00	278,246
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,076	25	\$127	15%	90%	\$0.00	671,517
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,718	25	\$1,901	15%	25%	\$0.05	53,000
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,718	25	\$1,901	15%	25%	\$0.05	127,911

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	2,022	10	\$18,014	25%	95%	\$1.51	0.00
Electric	Lodging	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	1,337	10	\$17,339	0.0%	0%	\$2.20	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	142	15	\$254	95%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	142	15	\$254	95%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	144	15	\$259	95%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	144	15	\$259	95%	90%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	6,777	20	\$13,417	100%	N/A	\$0.22	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	2,259	20	\$4,474	100%	N/A	\$0.22	0.00
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	5,039	20	\$9,976	100%	N/A	\$0.22	1
Electric	Lodging	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	5,039	20	\$9,976	100%	N/A	\$0.22	5
Electric	Lodging	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	877	7	\$18,833	95%	95%	\$4.76	0.00
Electric	Lodging	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	2,675	15	\$4,774	45%	95%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	2,140	7	\$2,226	10%	95%	\$0.23	0.00
Electric	Lodging	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	4,013	5	\$1,590	25%	25%	\$0.12	0.00
Electric	Lodging	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,204	12	\$5,449	10%	85%	\$0.68	0.00
Electric	Lodging	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,675	40	\$38,211	2.0%	100%	\$4.58	0.00
Electric	Lodging	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	9	25	\$3,456	75%	85%	\$37.87	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	9,823	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	9,823	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	9,855	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	9,855	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	3,376	25	\$127	80%	90%	\$0.00	160,686
Electric	Lodging	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	3,376	25	\$127	80%	90%	\$0.00	333,596
Electric	Lodging	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	827	15	\$509	50%	95%	\$0.08	359,534

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	872	15	\$509	50%	95%	\$0.08	347,476
Electric	Lodging	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	10,202	15	\$77,371	5.0%	70%	\$0.99	0.00
Electric	Lodging	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	10,754	15	\$77,371	5.0%	70%	\$0.94	0.00
Electric	Lodging	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,400	15	\$4,774	45%	95%	\$0.18	0.00
Electric	Lodging	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,584	15	\$4,774	45%	95%	\$0.17	0.00
Electric	Lodging	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	971	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Lodging	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	2,482	15	\$2,308	100%	N/A	\$0.12	0.00
Electric	Lodging	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	5,101	10	\$14,430	10%	30%	\$0.48	0.00
Electric	Lodging	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	5,377	10	\$14,430	10%	30%	\$0.46	0.00
Electric	Lodging	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	5,101	5	\$1,590	75%	75%	\$0.09	0.00
Electric	Lodging	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	5,377	5	\$1,590	75%	75%	\$0.09	2,784,717
Electric	Lodging	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	850	18	\$6,108	45%	85%	\$0.85	0.00
Electric	Lodging	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	896	18	\$6,108	45%	85%	\$0.81	0.00
Electric	Lodging	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	20,556	15	-\$48369.626	35%	N/A	-\$0.40	2,333,562
Electric	Lodging	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	20,556	15	-\$48369.626	35%	N/A	-\$0.40	2,943,414
Electric	Lodging	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,530	12	\$5,449	10%	85%	\$0.53	0.00
Electric	Lodging	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,613	12	\$5,449	10%	85%	\$0.51	0.00
Electric	Lodging	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,400	40	\$38,211	2.0%	100%	\$3.61	0.00
Electric	Lodging	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,584	40	\$38,211	2.0%	100%	\$3.42	0.00
Electric	Lodging	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,700	12	\$1,356	10%	60%	\$0.12	0.00
Electric	Lodging	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,792	12	\$1,356	10%	60%	\$0.11	81,992
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	55	25	\$7,184	45%	65%	\$13.27	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	58	25	\$7,184	45%	65%	\$12.58	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	11	25	\$3,456	25%	85%	\$29.80	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	12	25	\$3,456	25%	85%	\$28.27	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,020	20	\$1,392	45%	60%	\$0.15	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,075	20	\$1,409	45%	60%	\$0.15	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	612	20	\$244	45%	85%	\$0.04	199,203
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	645	20	\$246	45%	85%	\$0.04	192,523
Electric	Lodging	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,251	7	\$5,016	90%	95%	\$0.26	0.00
Electric	Lodging	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,481	7	\$5,016	90%	95%	\$0.25	0.00
Electric	Lodging	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	3,400	5	\$4,072	95%	50%	\$0.35	0.00
Electric	Lodging	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	3,584	5	\$4,072	95%	50%	\$0.33	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,823	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,823	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,855	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	9,855	10	\$11,977	35%	70%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,291	25	\$127	15%	90%	\$0.00	634,637
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,523	25	\$127	15%	90%	\$0.00	613,353
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,913	25	\$1,901	15%	25%	\$0.05	124,003
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	4,125	25	\$1,901	15%	25%	\$0.05	119,845
Electric	Lodging	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,033	7	\$18,833	95%	95%	\$4.04	0.00
Electric	Lodging	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,084	7	\$18,833	95%	95%	\$3.85	0.00
Electric	Lodging	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,149	15	\$4,774	45%	95%	\$0.20	0.00
Electric	Lodging	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,306	15	\$4,774	45%	95%	\$0.19	0.00
Electric	Lodging	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	Premium Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	971	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Lodging	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	2,482	15	\$1,847	100%	N/A	\$0.10	0.00
Electric	Lodging	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	2,482	15	\$1,847	100%	N/A	\$0.10	82,031
Electric	Lodging	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	4,724	5	\$1,590	25%	25%	\$0.10	0.00
Electric	Lodging	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	4,960	5	\$1,590	25%	25%	\$0.09	29,186

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	20,556	15	\$-35262.361	35%	N/A	\$-0.29	490,540
Electric	Lodging	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	20,556	15	\$-35262.361	35%	N/A	\$-0.29	809,961
Electric	Lodging	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,417	12	\$5,449	10%	85%	\$0.58	0.00
Electric	Lodging	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,488	12	\$5,449	10%	85%	\$0.55	0.00
Electric	Lodging	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,149	40	\$38,211	2.0%	100%	\$3.89	0.00
Electric	Lodging	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,306	40	\$38,211	2.0%	100%	\$3.71	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	10	25	\$3,456	75%	85%	\$32.17	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	11	25	\$3,456	75%	85%	\$30.64	0.00
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	566	20	\$244	45%	85%	\$0.05	12,546
Electric	Lodging	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	595	20	\$246	45%	85%	\$0.05	16,975
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,823	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,823	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,855	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	9,855	10	\$11,977	0.0%	0%	\$0.21	0.00
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	3,973	25	\$127	80%	90%	\$0.00	230,481
Electric	Lodging	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	4,172	25	\$127	80%	90%	\$0.00	311,848
Electric	Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	10	6	\$0.00	100%	N/A	\$0.00	74,032
Electric	Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	10	6	\$0.00	100%	N/A	\$0.00	75,012
Electric	Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	10	6	\$0.00	100%	N/A	\$0.00	11,193
Electric	Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	10	6	\$0.00	100%	N/A	\$0.00	13,172
Electric	Lodging	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	67	4	\$76	100%	N/A	\$0.40	0.00
Electric	Lodging	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	67	4	\$76	100%	N/A	\$0.40	13
Electric	Lodging	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	67	4	\$76	100%	N/A	\$0.40	18
Electric	Lodging	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	23	20	\$5	100%	N/A	\$0.02	0.00
Electric	Lodging	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	64	20	\$2	100%	N/A	\$0.00	127,614
Electric	Lodging	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	64	20	\$2	100%	N/A	\$0.00	-2335.138308
Electric	Lodging	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	445	20	\$61	8.8%	100%	\$0.02	324,815

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	445	20	\$61	8.8%	100%	\$0.02	324,815
Electric	Lodging	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	526	20	\$63	8.8%	100%	\$0.01	356,034
Electric	Lodging	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	526	20	\$63	8.8%	100%	\$0.01	356,034
Electric	Lodging	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	23	20	\$5	100%	N/A	\$0.02	0.00
Electric	Lodging	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	64	20	\$2	100%	N/A	\$0.00	44,281
Electric	Lodging	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	64	20	\$2	100%	N/A	\$0.00	-303.207252
Electric	Lodging	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	1,851	15	\$8,597	100%	N/A	\$0.61	0.00
Electric	Lodging	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	4,069	15	\$17,194	100%	N/A	\$0.55	0.00
Electric	Lodging	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,308	15	\$509	50%	95%	\$0.05	312,168
Electric	Lodging	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,308	15	\$509	50%	95%	\$0.05	414,033
Electric	Lodging	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	14,453	15	\$77,371	5.0%	70%	\$0.70	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,368	15	\$4,774	45%	95%	\$0.46	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,368	15	\$4,774	45%	95%	\$0.46	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,404	15	\$4,774	45%	95%	\$0.26	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,404	15	\$4,774	45%	95%	\$0.26	0.00
Electric	Lodging	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	7,226	5	\$1,590	75%	75%	\$0.06	2,234,365
Electric	Lodging	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	7,226	5	\$1,590	75%	75%	\$0.06	2,963,470
Electric	Lodging	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	1,204	18	\$6,108	45%	85%	\$0.60	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,619	14	\$43,775	5.0%	95%	\$1.65	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,619	14	\$43,775	5.0%	95%	\$1.65	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	5,174	14	\$43,775	5.0%	95%	\$1.15	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	5,174	14	\$43,775	5.0%	95%	\$1.15	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,168	12	\$5,449	10%	85%	\$0.38	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,368	40	\$38,211	2.0%	100%	\$8.97	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,368	40	\$38,211	2.0%	100%	\$8.97	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,404	40	\$38,211	2.0%	100%	\$5.10	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,404	40	\$38,211	2.0%	100%	\$5.10	0.00
Electric	Lodging	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	13,381	30	\$9,760	5.0%	N/A	\$3.56	0.00
Electric	Lodging	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,613	12	\$1,356	10%	60%	\$0.06	98,830
Electric	Lodging	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,613	12	\$1,356	10%	60%	\$0.06	131,080
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,831	25	\$7,184	45%	65%	\$0.26	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,831	25	\$7,184	45%	65%	\$0.26	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,013	25	\$7,184	45%	65%	\$0.18	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,013	25	\$7,184	45%	65%	\$0.18	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	606	25	\$3,456	25%	85%	\$0.58	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	606	25	\$3,456	25%	85%	\$0.58	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	859	25	\$3,456	25%	85%	\$0.41	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	859	25	\$3,456	25%	85%	\$0.41	0.00
Electric	Lodging	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,445	20	\$1,392	45%	60%	\$0.11	0.00
Electric	Lodging	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,445	20	\$1,409	45%	60%	\$0.11	0.00
Electric	Lodging	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	867	20	\$244	45%	85%	\$0.03	154,249
Electric	Lodging	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	867	20	\$246	45%	85%	\$0.03	204,583
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8,380	25	\$12,824	15%	85%	\$0.16	588,848
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8,380	25	\$12,824	15%	85%	\$0.16	588,848
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	13,293	25	\$12,824	15%	85%	\$0.10	703,167
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	13,293	25	\$12,824	15%	85%	\$0.10	703,167
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,190	25	\$3,957	15%	95%	\$0.34	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,190	25	\$3,957	15%	95%	\$0.34	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,859	25	\$3,957	15%	95%	\$0.22	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,859	25	\$3,957	15%	95%	\$0.22	0.00
Electric	Lodging	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	7,683	25	\$31,528	10%	45%	\$0.42	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	6,022	7	\$5,016	90%	95%	\$0.18	0.00
Electric	Lodging	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	4,817	3	\$4,072	95%	50%	\$0.39	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	2,798	10	\$11,977	35%	70%	\$0.73	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	2,798	10	\$11,977	35%	70%	\$0.73	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	4,902	10	\$11,977	35%	70%	\$0.42	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	4,902	10	\$11,977	35%	70%	\$0.42	0.00
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,322	25	\$127	15%	90%	\$0.01	83,334
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,322	25	\$127	15%	90%	\$0.01	110,527
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	2,068	25	\$1,901	15%	25%	\$0.09	32,233
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	2,068	25	\$1,901	15%	25%	\$0.09	41,803
Electric	Lodging	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,851	15	\$6,879	100%	N/A	\$0.49	0.00
Electric	Lodging	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	4,069	15	\$13,756	100%	N/A	\$0.44	120
Electric	Lodging	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	4,069	15	\$13,756	100%	N/A	\$0.44	162
Electric	Lodging	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,461	7	\$18,833	95%	95%	\$2.86	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,265	15	\$4,774	45%	95%	\$0.49	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,265	15	\$4,774	45%	95%	\$0.49	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	2,224	15	\$4,774	45%	95%	\$0.28	0.00
Electric	Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	2,224	15	\$4,774	45%	95%	\$0.28	0.00
Electric	Lodging	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	6,685	5	\$1,590	25%	25%	\$0.07	31,893
Electric	Lodging	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	6,685	5	\$1,590	25%	25%	\$0.07	33,054
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,348	14	\$43,775	5.0%	95%	\$1.78	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,348	14	\$43,775	5.0%	95%	\$1.78	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	4,786	14	\$43,775	5.0%	95%	\$1.25	0.00
Electric	Lodging	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	4,786	14	\$43,775	5.0%	95%	\$1.25	0.00
Electric	Lodging	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,005	12	\$5,449	10%	85%	\$0.41	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,265	40	\$38,211	2.0%	100%	\$9.69	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,265	40	\$38,211	2.0%	100%	\$9.69	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,224	40	\$38,211	2.0%	100%	\$5.51	0.00
Electric	Lodging	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,224	40	\$38,211	2.0%	100%	\$5.51	0.00
Electric	Lodging	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	13,381	30	\$61,855	5.0%	N/A	\$1.80	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	560	25	\$3,456	75%	85%	\$0.63	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	560	25	\$3,456	75%	85%	\$0.63	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	795	25	\$3,456	75%	85%	\$0.44	0.00
Electric	Lodging	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	795	25	\$3,456	75%	85%	\$0.44	0.00
Electric	Lodging	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	802	20	\$244	45%	85%	\$0.03	16,969
Electric	Lodging	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	802	20	\$246	45%	85%	\$0.03	19,224
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,101	25	\$3,957	15%	95%	\$0.37	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,101	25	\$3,957	15%	95%	\$0.37	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,719	25	\$3,957	15%	95%	\$0.23	0.00
Electric	Lodging	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,719	25	\$3,957	15%	95%	\$0.23	0.00
Electric	Lodging	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	657	25	\$3,295	95%	85%	\$0.51	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	New	2,798	10	\$11,977	0.0%	0%	\$0.73	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	New	2,798	10	\$11,977	0.0%	0%	\$0.73	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	New	4,902	10	\$11,977	0.0%	0%	\$0.42	0.00
Electric	Lodging	Heat Pump	Window Film	Window Film	No Film	Per Building	New	4,902	10	\$11,977	0.0%	0%	\$0.42	0.00
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,223	25	\$127	80%	90%	\$0.01	49,695
Electric	Lodging	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,223	25	\$127	80%	90%	\$0.01	56,301
Electric	Lodging	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	3,640	8	\$794	75%	70%	\$0.04	0.00
Electric	Lodging	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	3,023	15	\$1,285	62%	90%	\$0.06	0.00
Electric	Lodging	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	3,023	15	\$1,300	62%	90%	\$0.06	0.00
Electric	Lodging	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,645	8	\$1,463	90%	90%	\$0.11	0.00
Electric	Lodging	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,645	8	\$1,481	90%	90%	\$0.11	0.00
Electric	Lodging	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	2,383	8	\$664	5.0%	50%	\$0.06	0.00
Electric	Lodging	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	4,637	17	\$3,150	75%	50%	\$0.08	0.00
Electric	Lodging	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,259	8	\$58	25%	25%	\$0.01	651,343
Electric	Lodging	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,259	8	\$61	25%	25%	\$0.01	685,304
Electric	Lodging	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	3,640	8	\$794	75%	70%	\$0.04	0.00
Electric	Lodging	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	3,023	15	\$1,285	62%	90%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	3,023	15	\$1,300	62%	90%	\$0.06	0.00
Electric	Lodging	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	2,645	8	\$1,463	90%	90%	\$0.11	0.00
Electric	Lodging	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	2,645	8	\$1,481	90%	90%	\$0.11	0.00
Electric	Lodging	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	2,383	8	\$664	5.0%	50%	\$0.06	0.00
Electric	Lodging	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	4,637	17	\$3,150	75%	50%	\$0.08	0.00
Electric	Lodging	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	641	10	\$666	25%	75%	\$0.18	0.00
Electric	Lodging	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	641	10	\$674	25%	75%	\$0.18	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,562	8	\$9,345	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,562	8	\$9,345	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,585	8	\$9,345	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,585	8	\$9,345	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,672	8	\$7,006	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,672	8	\$7,006	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,688	8	\$7,006	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,688	8	\$7,006	5.0%	90%	\$0.52	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,313	13	\$27,479	50%	N/A	\$0.93	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,313	13	\$27,479	50%	N/A	\$0.93	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,315	13	\$27,275	50%	N/A	\$0.93	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,315	13	\$27,275	50%	N/A	\$0.93	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	965	13	\$682	100%	N/A	\$0.12	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	965	13	\$682	100%	N/A	\$0.12	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	966	13	\$702	100%	N/A	\$0.13	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	966	13	\$702	100%	N/A	\$0.13	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,774	13	\$3,224	100%	N/A	\$0.34	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,774	13	\$3,224	100%	N/A	\$0.34	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,008	13	\$3,252	100%	N/A	\$0.30	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,008	13	\$3,252	100%	N/A	\$0.30	0.00
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,775	13	\$483	100%	N/A	\$0.05	7,806,287
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,775	13	\$483	100%	N/A	\$0.05	7,806,287
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,007	13	\$478	100%	N/A	\$0.04	9,187,535
Electric	Lodging	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,007	13	\$478	100%	N/A	\$0.04	9,187,535
Electric	Lodging	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	5,050	8	\$1,463	5.0%	90%	\$0.06	0.00
Electric	Lodging	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	5,050	8	\$1,481	5.0%	90%	\$0.06	0.00
Electric	Lodging	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,404	8	\$58	5.0%	25%	\$0.00	209,400
Electric	Lodging	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,404	8	\$61	5.0%	25%	\$0.01	218,734
Electric	Lodging	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	202	15	\$150	100%	N/A	\$0.11	0.00
Electric	Lodging	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	264	15	\$638	95%	N/A	\$0.32	0.00
Electric	Lodging	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	223	29	\$4,746	50%	N/A	\$2.00	0.00
Electric	Lodging	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	136	20	\$-2,5451	25%	N/A	\$-0.04	25,263

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	136	20	\$-2,5451	25%	N/A	\$-0.04	25,636
Electric	Lodging	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	61	15	\$2,998	100%	N/A	\$6.23	0.00
Electric	Lodging	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	174	8	\$1,463	5.0%	90%	\$1.67	0.00
Electric	Lodging	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	174	8	\$1,481	5.0%	90%	\$1.69	0.00
Electric	Lodging	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	83	8	\$58	10%	25%	\$0.14	0.00
Electric	Lodging	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	83	8	\$61	10%	25%	\$0.15	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	178	11	\$68	95%	65%	\$0.06	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	178	11	\$68	95%	65%	\$0.06	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	180	11	\$71	95%	65%	\$0.06	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	180	11	\$71	95%	65%	\$0.06	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	35	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	35	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	36	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	36	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	1,298	10	\$666	25%	75%	\$0.09	0.00
Electric	Lodging	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	1,298	10	\$674	25%	75%	\$0.09	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,457	8	\$9,345	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,457	8	\$9,345	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,472	8	\$9,345	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,472	8	\$9,345	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	1,843	8	\$7,006	5.0%	90%	\$0.76	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	1,843	8	\$7,006	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	1,854	8	\$7,006	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	1,854	8	\$7,006	5.0%	90%	\$0.76	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	35	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	35	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	36	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	36	13	\$30	95%	95%	\$0.12	0.00
Electric	Lodging	Lighting Interior Other	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	14,597	15	\$3,099	60%	95%	\$0.03	9,042,233
Electric	Lodging	Lighting Interior Other	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	14,597	15	\$3,140	60%	95%	\$0.03	5,528,916
Electric	Lodging	Lighting Interior Other	Lighting Package - High Efficiency	25% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	16,231	13	\$3,944	100%	N/A	\$0.03	14,046,492
Electric	Lodging	Lighting Interior Other	Lighting Package - High Efficiency	25% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	16,231	13	\$17,869	100%	N/A	\$0.16	0.00
Electric	Lodging	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	10,225	8	\$1,463	5.0%	90%	\$0.03	445,372
Electric	Lodging	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	10,225	8	\$1,481	5.0%	90%	\$0.03	273,555
Electric	Lodging	Lighting Interior Screw Base	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	19,970	15	\$3,099	60%	95%	\$0.02	37,327,847
Electric	Lodging	Lighting Interior Screw Base	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	19,970	15	\$3,140	60%	95%	\$0.02	24,590,806
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	70,560	4	\$758	85%	N/A	\$-0.02	0.00
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	112,684	4	\$1,211	85%	N/A	\$-0.02	0.00
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	58,990	1	\$231	100%	N/A	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	94,206	1	\$371	100%	N/A	\$0.01	0.00
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	71,097	12	\$19,352	85%	N/A	\$0.02	43,872,940
Electric	Lodging	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	113,541	12	\$30,905	85%	N/A	\$0.02	69,481,364
Electric	Lodging	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	13,989	8	\$1,463	5.0%	90%	\$0.02	1,799,742
Electric	Lodging	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	13,989	8	\$1,481	5.0%	90%	\$0.02	1,185,632
Electric	Lodging	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	6,661	8	\$58	1.0%	25%	\$0.00	65,637
Electric	Lodging	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	6,661	8	\$61	1.0%	25%	\$0.00	43,240
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$2	10%	90%	\$0.19	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$2	10%	90%	\$0.19	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$2	10%	90%	\$0.16	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$2	10%	90%	\$0.16	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	16	4	\$0.00	25%	45%	\$0.00	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	19	10	\$0.00	95%	75%	\$0.00	130,807
Electric	Lodging	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	19	10	\$0.00	95%	75%	\$0.00	140,886
Electric	Lodging	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	746	10	\$526	95%	60%	\$0.12	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	200	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	200	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	202	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	202	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$2	10%	90%	\$0.19	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$2	10%	90%	\$0.19	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$2	10%	90%	\$0.16	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$2	10%	90%	\$0.16	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	16	4	\$0.00	25%	45%	\$0.00	0.00
Electric	Lodging	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	19	10	\$0.00	95%	75%	\$0.00	14,699
Electric	Lodging	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	19	10	\$0.00	95%	75%	\$0.00	17,534
Electric	Lodging	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	746	10	\$526	95%	60%	\$0.12	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	200	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	200	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	202	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	202	4	\$40	60%	90%	\$0.07	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	507	9	\$3,359	50%	N/A	\$1.21	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	507	9	\$3,359	50%	N/A	\$1.21	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	646	9	\$3,359	50%	N/A	\$0.95	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	646	9	\$3,359	50%	N/A	\$0.95	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	507	9	\$2,687	50%	N/A	\$0.97	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	507	9	\$2,687	50%	N/A	\$0.97	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	646	9	\$2,687	50%	N/A	\$0.76	0.00
Electric	Lodging	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	646	9	\$2,687	50%	N/A	\$0.76	0.00
Electric	Lodging	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	265	15	\$4,774	45%	95%	\$2.35	0.00
Electric	Lodging	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	338	15	\$4,774	45%	95%	\$1.84	0.00
Electric	Lodging	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	119	12	\$5,449	10%	85%	\$6.84	0.00
Electric	Lodging	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	152	12	\$5,449	10%	85%	\$5.37	0.00
Electric	Lodging	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	265	40	\$38,211	2.0%	100%	\$46.15	0.00
Electric	Lodging	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	338	40	\$38,211	2.0%	100%	\$36.25	0.00
Electric	Lodging	Package Terminal Ac	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	597	15	\$3,140	60%	95%	\$0.69	0.00
Electric	Lodging	Package Terminal Ac	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	760	15	\$3,099	60%	95%	\$0.53	0.00
Electric	Lodging	Package Terminal Ac	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	132	12	\$1,356	10%	60%	\$1.53	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Package Terminal Ac	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	169	12	\$1,356	10%	60%	\$1.20	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4	25	\$7,184	45%	65%	\$169.74	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	5	25	\$7,184	45%	65%	\$133.32	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.92	25	\$3,456	25%	85%	\$381.25	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1	25	\$3,456	25%	85%	\$299.44	0.00
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	335	25	\$127	15%	90%	\$0.04	985,283
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	335	25	\$127	80%	90%	\$0.04	985,283
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	426	25	\$127	15%	90%	\$0.03	212,072
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	426	25	\$127	80%	90%	\$0.03	212,072
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	305	25	\$1,901	15%	25%	\$0.63	0.00
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	389	25	\$1,901	15%	25%	\$0.50	0.00
Electric	Lodging	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	265	15	\$4,774	45%	95%	\$2.35	0.00
Electric	Lodging	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	338	15	\$4,774	45%	95%	\$1.84	0.00
Electric	Lodging	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	119	12	\$5,449	10%	85%	\$6.84	0.00
Electric	Lodging	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	152	12	\$5,449	10%	85%	\$5.37	0.00
Electric	Lodging	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	265	40	\$38,211	2.0%	100%	\$46.15	0.00
Electric	Lodging	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	338	40	\$38,211	2.0%	100%	\$36.25	0.00
Electric	Lodging	Package Terminal Ac	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	597	15	\$3,140	60%	95%	\$0.69	0.00
Electric	Lodging	Package Terminal Ac	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	760	15	\$3,099	60%	95%	\$0.53	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.92	25	\$3,456	75%	85%	\$381.25	0.00
Electric	Lodging	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1	25	\$3,456	75%	85%	\$299.44	0.00
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	335	25	\$127	80%	90%	\$0.04	95,353
Electric	Lodging	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	426	25	\$127	80%	90%	\$0.03	130,787
Electric	Lodging	Package Terminal HP	PTHP (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER, 3.5 COP	Standard Efficiency - 10.2 EER, 3.0 COP	Per Building	Existing	1,086	9	\$10,307	100%	N/A	\$1.74	0.00
Electric	Lodging	Package Terminal HP	PTHP (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER, 3.5 COP	Standard Efficiency - 10.2 EER, 3.0 COP	Per Building	New	1,086	9	\$8,246	100%	N/A	\$1.39	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Package Terminal Hp	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,012	15	\$4,774	45%	95%	\$0.31	0.00
Electric	Lodging	Package Terminal Hp	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,313	12	\$5,449	10%	85%	\$0.35	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,459	40	\$38,211	2.0%	100%	\$8.40	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,459	40	\$38,211	2.0%	100%	\$8.40	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,565	40	\$38,211	2.0%	100%	\$4.78	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,565	40	\$38,211	2.0%	100%	\$4.78	0.00
Electric	Lodging	Package Terminal Hp	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	11,557	15	\$3,099	60%	95%	\$0.04	21,917,152
Electric	Lodging	Package Terminal Hp	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	Existing	11,557	15	\$3,140	60%	95%	\$0.04	23,595,066
Electric	Lodging	Package Terminal Hp	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,855	12	\$1,356	10%	60%	\$0.05	499,225
Electric	Lodging	Package Terminal Hp	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,855	12	\$1,356	10%	60%	\$0.05	537,444
Electric	Lodging	Package Terminal Hp	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,042	25	\$7,184	45%	65%	\$0.12	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1,294	25	\$3,456	25%	85%	\$0.27	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	21,572	25	\$12,824	15%	85%	\$0.06	5,909,520
Electric	Lodging	Package Terminal Hp	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	21,572	25	\$12,824	15%	85%	\$0.06	6,361,935
Electric	Lodging	Package Terminal Hp	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	2,845	25	\$3,957	15%	95%	\$0.14	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	758	25	\$31,528	10%	45%	\$4.24	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	758	25	\$31,528	10%	45%	\$4.24	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	8,198	25	\$31,528	10%	45%	\$0.39	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	8,198	25	\$31,528	10%	45%	\$0.39	0.00
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,269	25	\$127	15%	90%	\$0.01	965,773
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,269	25	\$127	15%	90%	\$0.01	5,693,041
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,269	25	\$127	80%	90%	\$0.01	965,773
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	2,269	25	\$127	80%	90%	\$0.01	5,693,041
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	2,834	25	\$1,901	15%	25%	\$0.07	216,139
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	2,834	25	\$1,901	15%	25%	\$0.07	232,686
Electric	Lodging	Package Terminal Hp	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	2,012	15	\$4,774	45%	95%	\$0.31	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Package Terminal Hp	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,313	12	\$5,449	10%	85%	\$0.35	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,459	40	\$38,211	2.0%	100%	\$8.40	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,459	40	\$38,211	2.0%	100%	\$8.40	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,565	40	\$38,211	2.0%	100%	\$4.78	0.00
Electric	Lodging	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,565	40	\$38,211	2.0%	100%	\$4.78	0.00
Electric	Lodging	Package Terminal Hp	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	11,557	15	\$3,099	60%	95%	\$0.04	2,797,094
Electric	Lodging	Package Terminal Hp	Hotel Key Card Room Energy Control System	Key card system to control room HVAC and lighting during non-occupied periods	325 sqft room, \$100/room	Per Building	New	11,557	15	\$3,140	60%	95%	\$0.04	2,406,111
Electric	Lodging	Package Terminal Hp	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1,294	25	\$3,456	75%	85%	\$0.27	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	2,845	25	\$3,957	15%	95%	\$0.14	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	758	25	\$3,295	95%	85%	\$0.44	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	758	25	\$3,295	95%	85%	\$0.44	0.00
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	8,198	25	\$3,295	95%	85%	\$0.04	1,624,075
Electric	Lodging	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	8,198	25	\$3,295	95%	85%	\$0.04	1,624,075
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,269	25	\$127	80%	90%	\$0.01	567,517
Electric	Lodging	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,269	25	\$127	80%	90%	\$0.01	601,112
Electric	Lodging	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	29	6	\$35	100%	N/A	\$0.31	0.00
Electric	Lodging	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	29	6	\$35	100%	N/A	\$0.31	7
Electric	Lodging	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	29	6	\$35	100%	N/A	\$0.31	11
Electric	Lodging	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$150	100%	N/A	\$0.01	1,185,785
Electric	Lodging	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$150	100%	N/A	\$0.01	1,186,542
Electric	Lodging	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$498	75%	N/A	\$0.01	11,885,293
Electric	Lodging	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$498	75%	N/A	\$0.01	12,016,061
Electric	Lodging	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$150	75%	25%	\$0.00	3,830,221
Electric	Lodging	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$150	75%	25%	\$0.00	4,125,359
Electric	Lodging	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$150	100%	N/A	\$0.01	222,640
Electric	Lodging	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$150	100%	N/A	\$0.01	261,872
Electric	Lodging	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$498	75%	N/A	\$0.01	2,163,996
Electric	Lodging	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$498	75%	N/A	\$0.01	2,547,605
Electric	Lodging	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	126	6	\$20	100%	N/A	\$0.04	7,847

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	126	6	\$20	100%	N/A	\$0.04	14,200
Electric	Lodging	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	126	6	\$20	100%	N/A	\$0.04	0.00
Electric	Lodging	Refrigeration	Commercial Refrigerator - No Doors - Med Temp	Commercial Refrigerator - No Doors - Med Temp	Standard Case	Per Building	Existing	717	10	\$595	5.0%	80%	\$0.14	0.00
Electric	Lodging	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	973	10	\$806	5.0%	80%	\$0.14	0.00
Electric	Lodging	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	521	10	\$432	5.0%	80%	\$0.14	0.00
Electric	Lodging	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	707	10	\$585	5.0%	80%	\$0.14	0.00
Electric	Lodging	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	798	20	\$2,170	100%	N/A	\$0.31	0.00
Electric	Lodging	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	894	20	\$2,911	100%	N/A	\$0.37	0.00
Electric	Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	701	20	\$170	100%	N/A	\$0.03	584,301
Electric	Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	701	20	\$170	100%	N/A	\$0.03	633,973
Electric	Lodging	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	223	20	\$76	100%	N/A	\$0.04	0.00
Electric	Lodging	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,471	20	\$577	8.8%	100%	\$0.01	3,049,619
Electric	Lodging	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,471	20	\$577	8.8%	100%	\$0.01	3,049,619
Electric	Lodging	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,582	20	\$559	8.8%	100%	\$0.01	3,351,578
Electric	Lodging	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	5,582	20	\$559	8.8%	100%	\$0.01	3,351,578
Electric	Lodging	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	798	20	\$2,170	100%	N/A	\$0.31	0.00
Electric	Lodging	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	894	20	\$2,911	100%	N/A	\$0.37	0.00
Electric	Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	701	20	\$170	100%	N/A	\$0.03	271,307
Electric	Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	701	20	\$170	100%	N/A	\$0.03	275,319
Electric	Lodging	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	223	20	\$76	100%	N/A	\$0.04	0.00
Electric	Lodging	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	284	15	\$4,774	45%	95%	\$2.19	0.00
Electric	Lodging	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	362	15	\$4,774	45%	95%	\$1.72	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	522	15	\$7,800	20%	65%	\$27.00	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	664	15	\$7,800	20%	65%	\$21.20	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	522	15	\$89,037	20%	65%	\$22.30	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	664	15	\$89,037	20%	65%	\$17.51	0.00
Electric	Lodging	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	128	12	\$5,449	10%	85%	\$6.38	0.00
Electric	Lodging	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	163	12	\$5,449	10%	85%	\$5.01	0.00
Electric	Lodging	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	284	40	\$38,211	2.0%	100%	\$43.08	0.00
Electric	Lodging	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	362	40	\$38,211	2.0%	100%	\$33.83	0.00
Electric	Lodging	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	142	12	\$1,356	10%	60%	\$1.43	0.00
Electric	Lodging	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	181	12	\$1,356	10%	60%	\$1.12	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4	25	\$7,184	45%	65%	\$158.41	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	5	25	\$7,184	45%	65%	\$124.42	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.98	25	\$3,456	25%	85%	\$355.81	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1	25	\$3,456	25%	85%	\$279.46	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	266	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	266	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	338	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	338	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	359	25	\$127	15%	90%	\$0.04	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	457	25	\$127	15%	90%	\$0.03	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	327	25	\$1,901	15%	25%	\$0.59	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	417	25	\$1,901	15%	25%	\$0.46	0.00
Electric	Lodging	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	284	15	\$4,774	45%	95%	\$2.19	0.00
Electric	Lodging	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	362	15	\$4,774	45%	95%	\$1.72	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	522	15	\$86,240	20%	65%	\$21.60	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	664	15	\$86,240	20%	65%	\$16.96	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	522	15	\$71,232	20%	65%	\$17.84	0.00
Electric	Lodging	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	664	15	\$71,232	20%	65%	\$14.01	0.00
Electric	Lodging	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	128	12	\$5,449	10%	85%	\$6.38	0.00
Electric	Lodging	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	163	12	\$5,449	10%	85%	\$5.01	0.00
Electric	Lodging	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	284	40	\$38,211	2.0%	100%	\$43.08	0.00
Electric	Lodging	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	362	40	\$38,211	2.0%	100%	\$33.83	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.98	25	\$3,456	75%	85%	\$355.81	0.00
Electric	Lodging	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1	25	\$3,456	75%	85%	\$279.46	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	266	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	266	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	338	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	338	9	\$48	100%	N/A	\$0.03	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	359	25	\$127	80%	90%	\$0.04	0.00
Electric	Lodging	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	457	25	\$127	80%	90%	\$0.03	0.00
Electric	Lodging	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	6,608	15	\$89,075	20%	65%	\$1.76	0.00
Electric	Lodging	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	479	12	\$5,449	10%	85%	\$1.71	0.00
Electric	Lodging	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,064	12	\$1,356	10%	60%	\$0.19	0.00
Electric	Lodging	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,239	25	\$7,184	45%	65%	\$0.59	0.00
Electric	Lodging	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	265	25	\$3,456	25%	85%	\$1.33	0.00
Electric	Lodging	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3,719	25	\$12,824	15%	85%	\$0.35	0.00
Electric	Lodging	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	476	25	\$3,957	15%	95%	\$0.85	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,290	25	\$31,528	10%	45%	\$2.49	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,290	25	\$31,528	10%	45%	\$2.49	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	3,385	25	\$31,528	10%	45%	\$0.95	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	3,385	25	\$31,528	10%	45%	\$0.95	0.00
Electric	Lodging	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	6,608	15	\$61,084	20%	65%	\$1.21	0.00
Electric	Lodging	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	479	12	\$5,449	10%	85%	\$1.71	0.00
Electric	Lodging	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	265	25	\$3,456	75%	85%	\$1.33	0.00
Electric	Lodging	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	476	25	\$3,957	15%	95%	\$0.85	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,290	25	\$3,295	95%	85%	\$0.26	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,290	25	\$3,295	95%	85%	\$0.26	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	3,385	25	\$3,295	95%	85%	\$0.10	0.00
Electric	Lodging	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	3,385	25	\$3,295	95%	85%	\$0.10	0.00
Electric	Lodging	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	26	9	\$2	100%	N/A	\$0.02	129,935
Electric	Lodging	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	26	9	\$2	100%	N/A	\$0.02	130,892
Electric	Lodging	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	26	9	\$2	100%	N/A	\$0.02	16,771
Electric	Lodging	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	26	9	\$2	100%	N/A	\$0.02	19,695
Electric	Lodging	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	684	15	\$509	50%	95%	\$0.10	0.00
Electric	Lodging	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	6,847	15	\$77,371	5.0%	70%	\$1.48	0.00
Electric	Lodging	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	3,423	5	\$1,590	75%	75%	\$0.14	0.00
Electric	Lodging	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	570	18	\$6,108	45%	85%	\$1.27	0.00
Electric	Lodging	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,423	14	\$43,775	5.0%	95%	\$1.74	0.00
Electric	Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,027	12	\$5,449	10%	85%	\$0.80	0.00
Electric	Lodging	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	2,282	12	\$1,356	10%	60%	\$0.09	0.00
Electric	Lodging	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,656	25	\$7,184	45%	65%	\$0.28	0.00
Electric	Lodging	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	568	25	\$3,456	25%	85%	\$0.62	0.00
Electric	Lodging	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	684	20	\$1,392	45%	60%	\$0.23	0.00
Electric	Lodging	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	684	20	\$1,409	45%	60%	\$0.23	0.00
Electric	Lodging	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	410	20	\$244	45%	85%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	410	20	\$246	45%	85%	\$0.07	0.00
Electric	Lodging	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	7,976	25	\$12,824	15%	85%	\$0.16	0.00
Electric	Lodging	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,021	25	\$3,957	15%	95%	\$0.39	0.00
Electric	Lodging	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	7,258	25	\$31,528	10%	45%	\$0.44	0.00
Electric	Lodging	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,853	7	\$5,016	90%	95%	\$0.39	0.00
Electric	Lodging	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	748	7	\$18,833	95%	95%	\$5.58	0.00
Electric	Lodging	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	3,423	5	\$1,590	25%	25%	\$0.14	0.00
Electric	Lodging	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,423	14	\$43,775	5.0%	95%	\$1.74	0.00
Electric	Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,027	12	\$5,449	10%	85%	\$0.80	0.00
Electric	Lodging	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	568	25	\$3,456	75%	85%	\$0.62	0.00
Electric	Lodging	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	410	20	\$244	45%	85%	\$0.07	0.00
Electric	Lodging	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	410	20	\$246	45%	85%	\$0.07	0.00
Electric	Lodging	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,021	25	\$3,957	15%	95%	\$0.39	0.00
Electric	Lodging	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,766	25	\$3,295	95%	85%	\$0.12	0.00
Electric	Lodging	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,285	10	\$313	100%	N/A	\$0.02	6,026,153
Electric	Lodging	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,285	10	\$313	100%	N/A	\$0.02	6,287,057
Electric	Lodging	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,285	10	\$313	100%	N/A	\$0.02	1,099,594
Electric	Lodging	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,285	10	\$313	100%	N/A	\$0.02	1,288,380
Electric	Lodging	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	1,812	10	\$3,120	5.0%	90%	\$0.29	0.00
Electric	Lodging	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,719	15	\$77,371	5.0%	70%	\$3.72	0.00
Electric	Lodging	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	1,119	18	\$5,250	95%	45%	\$0.55	0.00
Electric	Lodging	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	92	15	\$167	95%	90%	\$0.24	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	2,311	20	\$2,835	55%	65%	\$0.14	0.00
Electric	Lodging	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	449	7	\$127	65%	25%	\$0.06	0.00
Electric	Lodging	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	1,812	10	\$3,120	5.0%	90%	\$0.29	0.00
Electric	Lodging	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	1,119	18	\$5,250	95%	45%	\$0.55	0.00
Electric	Lodging	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	92	15	\$167	95%	90%	\$0.24	0.00
Electric	Lodging	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	2,311	20	\$2,835	55%	45%	\$0.14	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1,050	9	\$402	25%	95%	\$0.07	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	495	14	\$165	5.0%	95%	\$0.05	15,532
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	495	14	\$165	5.0%	95%	\$0.05	16,418
Electric	Lodging	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1,101	10	\$7,070	55%	80%	\$1.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$71	10%	35%	\$0.41	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	263	12	\$150	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	263	12	\$150	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	278	12	\$160	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	278	12	\$160	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	241	12	\$150	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	241	12	\$150	60%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	255	12	\$157	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	255	12	\$157	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	220	12	\$509	75%	75%	\$0.35	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	4,406	25	\$15,998	2.5%	95%	\$0.37	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	851	9	\$10	95%	75%	\$0.00	757,097
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	851	9	\$10	95%	75%	\$0.00	800,256
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	350	9	\$5	95%	50%	\$0.00	207,830
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	350	9	\$5	95%	50%	\$0.00	219,678
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	132	9	\$211	95%	25%	\$0.29	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	644	4	\$195	95%	95%	\$0.11	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,399	10	\$185	95%	85%	\$0.01	2,851,916
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,399	10	\$185	95%	85%	\$0.01	2,851,916
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,442	10	\$190	95%	85%	\$0.01	3,052,174
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,442	10	\$190	95%	85%	\$0.01	3,052,174
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,741	10	\$465	95%	25%	\$0.03	676,493
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,741	10	\$465	95%	25%	\$0.03	676,493
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,776	10	\$470	95%	25%	\$0.03	723,996
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,776	10	\$470	95%	25%	\$0.03	723,996
Electric	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	550	10	\$3,140	75%	85%	\$0.97	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	550	10	\$3,178	75%	85%	\$0.98	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	13,153	15	\$6,449	75%	N/A	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	12,999	15	\$3,855	75%	N/A	\$0.06	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1,050	9	\$402	25%	95%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	495	14	\$165	5.0%	95%	\$0.05	1,241
Electric	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	495	14	\$165	5.0%	95%	\$0.05	1,563
Electric	Lodging	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1,092	10	\$7,070	55%	80%	\$1.10	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$71	10%	35%	\$0.41	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	253	12	\$145	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	253	12	\$145	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	268	12	\$152	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	268	12	\$152	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	232	12	\$142	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	232	12	\$142	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	245	12	\$152	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	245	12	\$152	60%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	4,369	25	\$12,799	2.5%	95%	\$0.30	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	844	9	\$10	95%	75%	\$0.00	60,760
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	844	9	\$10	95%	75%	\$0.00	76,313
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	347	9	\$5	95%	50%	\$0.00	16,679
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	347	9	\$5	95%	50%	\$0.00	20,948
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	644	4	\$195	95%	95%	\$0.11	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,399	10	\$185	95%	85%	\$0.01	289,864
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,399	10	\$185	95%	85%	\$0.01	289,864
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,442	10	\$190	95%	85%	\$0.01	233,674
Electric	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,442	10	\$190	95%	85%	\$0.01	233,674
Electric	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	546	10	\$3,140	75%	85%	\$0.98	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	546	10	\$3,178	75%	85%	\$0.99	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	13,153	15	\$6,449	75%	N/A	\$0.09	0.00
Electric	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	12,999	15	\$3,855	75%	N/A	\$0.06	0.00
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1,050	9	\$402	25%	95%	\$0.07	0.00
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	495	14	\$165	5.0%	95%	\$0.05	35,193
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	495	14	\$165	5.0%	95%	\$0.05	37,201
Electric	Lodging	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1,151	10	\$7,070	25%	80%	\$1.04	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$71	75%	35%	\$0.41	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	263	12	\$150	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	263	12	\$150	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	278	12	\$160	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	278	12	\$160	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	241	12	\$150	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	241	12	\$150	50%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	255	12	\$157	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	255	12	\$157	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	230	12	\$509	75%	75%	\$0.33	0.00
Electric	Lodging	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	4,604	25	\$15,998	2.5%	95%	\$0.35	0.00
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	889	9	\$10	95%	75%	\$0.00	1,792,700
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	889	9	\$10	95%	75%	\$0.00	1,895,005
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	366	9	\$5	95%	50%	\$0.00	492,113
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	366	9	\$5	95%	50%	\$0.00	520,197
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	138	9	\$211	95%	25%	\$0.28	0.00
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	644	4	\$195	95%	95%	\$0.11	0.00
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,399	10	\$185	95%	85%	\$0.01	6,461,768
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,399	10	\$185	95%	85%	\$0.01	6,461,768
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,442	10	\$190	95%	85%	\$0.01	6,915,907
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	3,442	10	\$190	95%	85%	\$0.01	6,915,907
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,741	10	\$465	95%	25%	\$0.03	1,532,775
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,741	10	\$465	95%	25%	\$0.03	1,532,775
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,776	10	\$470	95%	25%	\$0.03	1,640,499
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2,776	10	\$470	95%	25%	\$0.03	1,640,499
Electric	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	575	10	\$3,140	75%	85%	\$0.93	0.00
Electric	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	575	10	\$3,178	75%	85%	\$0.94	0.00
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	12,164	15	\$33,114	75%	N/A	\$0.40	0.00
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	711	15	\$1,445	100%	N/A	\$0.27	0.00
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1,050	9	\$402	25%	95%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	495	14	\$165	5.0%	95%	\$0.05	3,690
Electric	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	495	14	\$165	5.0%	95%	\$0.05	4,582
Electric	Lodging	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1,116	10	\$7,070	25%	80%	\$1.08	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$71	75%	35%	\$0.41	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	253	12	\$145	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	253	12	\$145	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	268	12	\$152	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	268	12	\$152	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	232	12	\$142	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	232	12	\$142	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	245	12	\$152	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	245	12	\$152	50%	95%	\$0.09	0.00
Electric	Lodging	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	4,466	25	\$12,799	2.5%	95%	\$0.29	0.00
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	862	9	\$10	95%	75%	\$0.00	184,592
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	862	9	\$10	95%	75%	\$0.00	228,756
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	355	9	\$5	95%	50%	\$0.00	50,672
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	355	9	\$5	95%	50%	\$0.00	62,795
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	644	4	\$195	95%	95%	\$0.11	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,399	10	\$185	95%	85%	\$0.01	850,010
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,399	10	\$185	95%	85%	\$0.01	850,010
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,442	10	\$190	95%	85%	\$0.01	694,479
Electric	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	3,442	10	\$190	95%	85%	\$0.01	694,479
Electric	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	558	10	\$3,140	75%	85%	\$0.96	0.00
Electric	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	558	10	\$3,178	75%	85%	\$0.97	0.00
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	12,164	15	\$33,114	75%	N/A	\$0.40	400
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	12,164	15	\$33,114	75%	N/A	\$0.40	897
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	711	15	\$1,445	100%	N/A	\$0.27	-687.88776
Electric	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	711	15	\$1,445	100%	N/A	\$0.27	-75.023268
Electric	Miscellaneous	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	365	4	\$41	100%	N/A	\$0.04	621,649
Electric	Miscellaneous	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	365	4	\$41	100%	N/A	\$0.04	689,849
Electric	Miscellaneous	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	563	4	\$42	95%	85%	\$0.03	15,132,590
Electric	Miscellaneous	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	563	4	\$42	95%	85%	\$0.03	17,145,153
Electric	Miscellaneous	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	365	4	\$41	100%	N/A	\$0.04	220,474
Electric	Miscellaneous	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	365	4	\$41	100%	N/A	\$0.04	241,248
Electric	Miscellaneous	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	563	4	\$42	95%	85%	\$0.03	1,873,190
Electric	Miscellaneous	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	563	4	\$42	95%	85%	\$0.03	2,124,185
Electric	Miscellaneous	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	16	12	\$8	1.0%	90%	\$0.08	0.00
Electric	Miscellaneous	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	10	12	\$27	1.0%	70%	\$0.39	0.00
Electric	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	18	12	\$4	1.0%	55%	\$0.03	2,616
Electric	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	18	12	\$4	1.0%	55%	\$0.03	2,864
Electric	Miscellaneous	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	26	12	\$17	1.0%	85%	\$0.10	0.00
Electric	Miscellaneous	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	44	12	\$24	1.0%	75%	\$0.08	0.00
Electric	Miscellaneous	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	16	12	\$8	1.0%	90%	\$0.08	0.00
Electric	Miscellaneous	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	10	12	\$27	1.0%	70%	\$0.39	0.00
Electric	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	18	12	\$4	1.0%	55%	\$0.03	297

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	18	12	\$4	1.0%	55%	\$0.03	349
Electric	Miscellaneous	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	26	12	\$17	1.0%	85%	\$0.10	0.00
Electric	Miscellaneous	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	44	12	\$24	1.0%	75%	\$0.08	0.00
Electric	Miscellaneous	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	192	15	\$219	25%	95%	\$0.15	0.00
Electric	Miscellaneous	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	192	15	\$219	25%	95%	\$0.15	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	898	10	\$7,657	25%	95%	\$1.45	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	898	10	\$7,657	25%	95%	\$1.45	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	594	10	\$5,970	75%	95%	\$1.71	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	594	10	\$5,970	75%	95%	\$1.71	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	594	15	\$17,779	45%	30%	\$3.91	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	594	15	\$17,779	45%	30%	\$3.91	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	80	15	\$185	90%	90%	\$0.30	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	80	15	\$185	90%	90%	\$0.30	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	127	15	\$294	90%	90%	\$0.30	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	127	15	\$294	90%	90%	\$0.30	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	48	15	\$85	75%	90%	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	48	15	\$85	75%	90%	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	76	15	\$137	75%	90%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	76	15	\$137	75%	90%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	2,492	20	\$5,702	100%	N/A	\$0.26	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	830	20	\$1,900	100%	N/A	\$0.26	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	1,853	20	\$4,240	100%	N/A	\$0.26	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,564	15	\$26,640	5.0%	70%	\$0.98	0.00
Electric	Miscellaneous	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,564	15	\$26,640	5.0%	70%	\$0.98	0.00
Electric	Miscellaneous	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,188	15	\$3,067	45%	95%	\$0.34	0.00
Electric	Miscellaneous	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,188	15	\$3,067	45%	95%	\$0.34	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	950	7	\$946	10%	95%	\$0.22	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	950	7	\$946	10%	95%	\$0.22	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	1,663	15	\$85	65%	35%	\$0.01	2,451,177
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	1,663	15	\$85	65%	35%	\$0.01	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	475	13	\$685	75%	75%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	475	13	\$685	75%	75%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,782	5	\$547	75%	75%	\$0.09	5,093,372
Electric	Miscellaneous	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,782	5	\$547	75%	75%	\$0.09	0.00
Electric	Miscellaneous	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	534	12	\$5,450	1.0%	85%	\$1.53	0.00
Electric	Miscellaneous	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	534	12	\$5,450	1.0%	85%	\$1.53	0.00
Electric	Miscellaneous	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,188	40	\$88,774	2.0%	100%	\$6.63	0.00
Electric	Miscellaneous	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,188	40	\$88,774	2.0%	100%	\$6.63	0.00
Electric	Miscellaneous	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	594	12	\$116	10%	60%	\$0.03	149,967
Electric	Miscellaneous	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	594	12	\$116	10%	60%	\$0.03	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	19	25	\$4,615	45%	65%	\$24.39	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	19	25	\$4,615	45%	65%	\$24.39	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$2,219	25%	85%	\$54.78	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$2,219	25%	85%	\$54.78	0.00
Electric	Miscellaneous	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,485	7	\$1,727	90%	95%	\$0.26	0.00
Electric	Miscellaneous	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,485	7	\$1,727	90%	95%	\$0.26	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	1,188	3	\$0.87	95%	20%	\$0.00	1,516,390
Electric	Miscellaneous	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	1,188	3	\$0.87	95%	20%	\$0.00	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	537	10	\$1,028	35%	70%	\$0.32	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	537	10	\$1,028	35%	70%	\$0.32	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	846	10	\$1,028	35%	70%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	846	10	\$1,028	35%	70%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,499	25	\$10	15%	90%	\$0.00	1,137,478
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,499	25	\$10	15%	90%	\$0.00	0.00
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,367	25	\$163	15%	25%	\$0.01	216,668
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,367	25	\$163	15%	25%	\$0.01	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	743	10	\$6,892	25%	95%	\$1.57	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	743	10	\$6,892	25%	95%	\$1.57	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	491	10	\$5,970	0.0%	0%	\$2.06	0.00
Electric	Miscellaneous	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	491	10	\$5,970	0.0%	0%	\$2.06	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	48	15	\$85	95%	90%	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	48	15	\$85	95%	90%	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	76	15	\$137	95%	90%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	76	15	\$137	95%	90%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	2,492	20	\$5,133	100%	N/A	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	830	20	\$1,711	100%	N/A	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	1,853	20	\$3,816	100%	N/A	\$0.23	22
Electric	Miscellaneous	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	1,853	20	\$3,816	100%	N/A	\$0.23	0.00
Electric	Miscellaneous	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	322	7	\$6,485	95%	95%	\$4.46	0.00
Electric	Miscellaneous	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	322	7	\$6,485	95%	95%	\$4.46	0.00
Electric	Miscellaneous	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	983	15	\$3,067	45%	95%	\$0.41	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	983	15	\$3,067	45%	95%	\$0.41	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	787	7	\$851	10%	95%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	787	7	\$851	10%	95%	\$0.24	0.00
Electric	Miscellaneous	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,475	5	\$547	25%	25%	\$0.11	0.00
Electric	Miscellaneous	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,475	5	\$547	25%	25%	\$0.11	0.00
Electric	Miscellaneous	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	442	12	\$5,450	1.0%	85%	\$1.85	0.00
Electric	Miscellaneous	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	442	12	\$5,450	1.0%	85%	\$1.85	0.00
Electric	Miscellaneous	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	983	40	\$88,774	2.0%	100%	\$8.01	0.00
Electric	Miscellaneous	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	983	40	\$88,774	2.0%	100%	\$8.01	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3	25	\$2,219	75%	85%	\$66.15	0.00
Electric	Miscellaneous	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3	25	\$2,219	75%	85%	\$66.15	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	537	10	\$1,028	0.0%	0%	\$0.32	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	537	10	\$1,028	0.0%	0%	\$0.32	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	846	10	\$1,028	0.0%	0%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	846	10	\$1,028	0.0%	0%	\$0.21	0.00
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,241	25	\$10	80%	90%	\$0.00	0.00
Electric	Miscellaneous	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,241	25	\$10	80%	90%	\$0.00	656,889
Electric	Miscellaneous	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	199	15	\$219	50%	95%	\$0.14	0.00
Electric	Miscellaneous	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	208	15	\$219	50%	95%	\$0.14	806,403
Electric	Miscellaneous	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,681	15	\$26,640	15%	70%	\$0.95	0.00
Electric	Miscellaneous	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,862	15	\$26,640	15%	70%	\$0.90	0.00
Electric	Miscellaneous	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,227	15	\$3,067	45%	95%	\$0.33	0.00
Electric	Miscellaneous	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,287	15	\$3,067	45%	95%	\$0.31	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	357	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	912	15	\$883	100%	N/A	\$0.13	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	1,840	10	\$5,521	10%	70%	\$0.51	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	1,931	10	\$5,521	10%	70%	\$0.49	0.00
Electric	Miscellaneous	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,840	5	\$547	75%	75%	\$0.09	17,031,335
Electric	Miscellaneous	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,931	5	\$547	75%	75%	\$0.08	10,742,826
Electric	Miscellaneous	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	306	18	\$2,103	45%	85%	\$0.81	0.00
Electric	Miscellaneous	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	321	18	\$2,103	45%	85%	\$0.77	0.00
Electric	Miscellaneous	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	7,558	15	\$-18506.062	35%	N/A	\$-0.41	8,901,080
Electric	Miscellaneous	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	7,558	15	\$-18506.062	35%	N/A	\$-0.41	14,985,902
Electric	Miscellaneous	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	552	12	\$5,450	1.0%	85%	\$1.48	0.00
Electric	Miscellaneous	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	579	12	\$5,450	1.0%	85%	\$1.41	0.00
Electric	Miscellaneous	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,227	40	\$88,774	2.0%	100%	\$6.42	0.00
Electric	Miscellaneous	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,287	40	\$88,774	2.0%	100%	\$6.12	0.00
Electric	Miscellaneous	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	613	12	\$116	10%	60%	\$0.03	504,941
Electric	Miscellaneous	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	643	12	\$116	10%	60%	\$0.03	317,679
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	19	25	\$4,615	45%	65%	\$23.62	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	20	25	\$4,615	45%	65%	\$22.51	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$2,219	25%	85%	\$53.03	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$2,219	25%	85%	\$50.55	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	368	20	\$469	45%	60%	\$0.14	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	386	20	\$745	45%	60%	\$0.22	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	220	20	\$82	45%	85%	\$0.04	1,155,363
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	231	20	\$131	45%	85%	\$0.06	657,600
Electric	Miscellaneous	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,534	7	\$1,727	90%	95%	\$0.25	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,609	7	\$1,727	90%	95%	\$0.24	0.00
Electric	Miscellaneous	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,227	5	\$1,558	95%	50%	\$0.37	0.00
Electric	Miscellaneous	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,287	5	\$1,558	95%	50%	\$0.35	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	537	10	\$1,028	35%	70%	\$0.32	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	537	10	\$1,028	35%	70%	\$0.32	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	846	10	\$1,028	35%	70%	\$0.21	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	846	10	\$1,028	35%	70%	\$0.21	0.00
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,548	25	\$10	15%	90%	\$0.00	3,707,912
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,624	25	\$10	15%	90%	\$0.00	2,322,730
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,412	25	\$163	15%	25%	\$0.01	729,524
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,481	25	\$163	15%	25%	\$0.01	455,621
Electric	Miscellaneous	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	373	7	\$6,485	95%	95%	\$3.85	0.00
Electric	Miscellaneous	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	390	7	\$6,485	95%	95%	\$3.69	0.00
Electric	Miscellaneous	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,138	15	\$3,067	45%	95%	\$0.35	0.00
Electric	Miscellaneous	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,189	15	\$3,067	45%	95%	\$0.34	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	357	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	912	15	\$707	100%	N/A	\$0.10	0.00
Electric	Miscellaneous	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	912	15	\$707	100%	N/A	\$0.10	310,649
Electric	Miscellaneous	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,707	5	\$547	25%	25%	\$0.09	137,769
Electric	Miscellaneous	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,784	5	\$547	25%	25%	\$0.09	111,295
Electric	Miscellaneous	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	7,558	15	-\$13492.178	35%	N/A	-\$0.31	2,716,696
Electric	Miscellaneous	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	7,558	15	-\$13492.178	35%	N/A	-\$0.31	3,067,273
Electric	Miscellaneous	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	512	12	\$5,450	1.0%	85%	\$1.60	0.00
Electric	Miscellaneous	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	535	12	\$5,450	1.0%	85%	\$1.53	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,138	40	\$88,774	2.0%	100%	\$6.92	0.00
Electric	Miscellaneous	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,189	40	\$88,774	2.0%	100%	\$6.62	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3	25	\$2,219	75%	85%	\$57.18	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	4	25	\$2,219	75%	85%	\$54.71	0.00
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	204	20	\$82	45%	85%	\$0.05	73,301
Electric	Miscellaneous	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	214	20	\$131	45%	85%	\$0.07	63,681
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	537	10	\$1,028	0.0%	0%	\$0.32	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	537	10	\$1,028	0.0%	0%	\$0.32	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	846	10	\$1,028	0.0%	0%	\$0.21	0.00
Electric	Miscellaneous	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	846	10	\$1,028	0.0%	0%	\$0.21	0.00
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,436	25	\$10	80%	90%	\$0.00	1,346,605
Electric	Miscellaneous	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,501	25	\$10	80%	90%	\$0.00	1,180,950
Electric	Miscellaneous	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	36	6	\$0.87	100%	N/A	\$0.01	1,234,929
Electric	Miscellaneous	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	36	6	\$0.87	100%	N/A	\$0.01	1,316,272
Electric	Miscellaneous	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	36	6	\$0.87	100%	N/A	\$0.01	196,410
Electric	Miscellaneous	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	36	6	\$0.87	100%	N/A	\$0.01	219,735
Electric	Miscellaneous	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	49	4	\$56	100%	N/A	\$0.40	0.00
Electric	Miscellaneous	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	49	4	\$56	100%	N/A	\$0.40	49
Electric	Miscellaneous	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	49	4	\$56	100%	N/A	\$0.40	65
Electric	Miscellaneous	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	4	20	\$0.87	100%	N/A	\$0.02	0.00
Electric	Miscellaneous	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	13	20	\$0.87	100%	N/A	\$0.01	137,879
Electric	Miscellaneous	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	13	20	\$0.87	100%	N/A	\$0.01	-2398.389888
Electric	Miscellaneous	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	92	20	\$13	8.8%	100%	\$0.02	350,941
Electric	Miscellaneous	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	92	20	\$13	8.8%	100%	\$0.02	350,941
Electric	Miscellaneous	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	109	20	\$13	8.8%	100%	\$0.01	365,678
Electric	Miscellaneous	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	109	20	\$13	8.8%	100%	\$0.01	365,678
Electric	Miscellaneous	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	4	20	\$0.87	100%	N/A	\$0.02	0.00
Electric	Miscellaneous	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	13	20	\$0.87	100%	N/A	\$0.01	47,842
Electric	Miscellaneous	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	13	20	\$0.87	100%	N/A	\$0.01	-311.419752

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	632	15	\$3,289	100%	N/A	\$0.68	0.00
Electric	Miscellaneous	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	1,281	15	\$6,579	100%	N/A	\$0.67	0.00
Electric	Miscellaneous	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	290	15	\$219	50%	95%	\$0.10	459,951
Electric	Miscellaneous	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	290	15	\$219	50%	95%	\$0.10	1,005,017
Electric	Miscellaneous	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	4,805	15	\$26,640	15%	70%	\$0.72	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	594	15	\$3,067	45%	95%	\$0.67	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	594	15	\$3,067	45%	95%	\$0.67	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,015	15	\$3,067	45%	95%	\$0.39	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,015	15	\$3,067	45%	95%	\$0.39	0.00
Electric	Miscellaneous	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	2,402	5	\$547	75%	75%	\$0.07	5,488,246
Electric	Miscellaneous	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	2,402	5	\$547	75%	75%	\$0.07	11,992,099
Electric	Miscellaneous	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	400	18	\$2,103	45%	85%	\$0.62	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	879	14	\$15,073	5.0%	95%	\$2.33	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	879	14	\$15,073	5.0%	95%	\$2.33	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,511	14	\$15,073	5.0%	95%	\$1.36	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,511	14	\$15,073	5.0%	95%	\$1.36	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	720	12	\$5,450	1.0%	85%	\$1.14	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	594	40	\$88,774	2.0%	100%	\$13.26	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	594	40	\$88,774	2.0%	100%	\$13.26	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,015	40	\$88,774	2.0%	100%	\$7.76	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,015	40	\$88,774	2.0%	100%	\$7.76	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	4,634	30	\$95,029	5.0%	N/A	\$3.93	0.00
Electric	Miscellaneous	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,201	12	\$116	10%	60%	\$0.01	244,964
Electric	Miscellaneous	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,201	12	\$116	10%	60%	\$0.01	531,575
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	694	25	\$4,615	45%	65%	\$0.68	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	694	25	\$4,615	45%	65%	\$0.68	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,175	25	\$4,615	45%	65%	\$0.40	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,175	25	\$4,615	45%	65%	\$0.40	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	148	25	\$2,219	25%	85%	\$1.52	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	148	25	\$2,219	25%	85%	\$1.52	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	251	25	\$2,219	25%	85%	\$0.90	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	251	25	\$2,219	25%	85%	\$0.90	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	480	20	\$469	45%	60%	\$0.11	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	480	20	\$745	45%	60%	\$0.17	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	288	20	\$82	45%	85%	\$0.03	372,309
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	288	20	\$131	45%	85%	\$0.05	733,408
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,761	25	\$8,238	15%	85%	\$0.48	1,483,574
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,761	25	\$8,238	15%	85%	\$0.48	1,483,574
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3,758	25	\$8,238	15%	85%	\$0.22	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3,758	25	\$8,238	15%	85%	\$0.22	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	256	25	\$2,541	15%	95%	\$1.01	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	256	25	\$2,541	15%	95%	\$1.01	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	528	25	\$2,541	15%	95%	\$0.49	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	528	25	\$2,541	15%	95%	\$0.49	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,554	25	\$20,251	10%	45%	\$0.81	0.00
Electric	Miscellaneous	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,002	7	\$1,727	90%	95%	\$0.19	0.00
Electric	Miscellaneous	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,002	7	\$1,727	90%	95%	\$0.19	13,507,615
Electric	Miscellaneous	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	1,601	3	\$1,558	95%	50%	\$0.44	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	199	10	\$1,028	35%	70%	\$0.88	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	199	10	\$1,028	35%	70%	\$0.88	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	536	10	\$1,028	35%	70%	\$0.33	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	536	10	\$1,028	35%	70%	\$0.33	0.00
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	752	25	\$10	15%	90%	\$0.00	440,073
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	752	25	\$10	15%	90%	\$0.00	954,962
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	916	25	\$163	15%	25%	\$0.02	116,297
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	916	25	\$163	15%	25%	\$0.02	252,365
Electric	Miscellaneous	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	632	15	\$2,631	100%	N/A	\$0.54	0.00
Electric	Miscellaneous	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,281	15	\$5,263	100%	N/A	\$0.54	366
Electric	Miscellaneous	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,281	15	\$5,263	100%	N/A	\$0.54	435
Electric	Miscellaneous	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	485	7	\$6,485	95%	95%	\$2.96	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	549	15	\$3,067	45%	95%	\$0.73	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	549	15	\$3,067	45%	95%	\$0.73	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	938	15	\$3,067	45%	95%	\$0.43	0.00
Electric	Miscellaneous	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	938	15	\$3,067	45%	95%	\$0.43	0.00
Electric	Miscellaneous	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	2,220	5	\$547	25%	25%	\$0.07	76,651
Electric	Miscellaneous	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	2,220	5	\$547	25%	25%	\$0.07	130,880
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	812	14	\$15,073	5.0%	95%	\$2.53	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	812	14	\$15,073	5.0%	95%	\$2.53	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,396	14	\$15,073	5.0%	95%	\$1.47	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,396	14	\$15,073	5.0%	95%	\$1.47	0.00
Electric	Miscellaneous	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	666	12	\$5,450	1.0%	85%	\$1.23	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	549	40	\$88,774	2.0%	100%	\$14.35	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	549	40	\$88,774	2.0%	100%	\$14.35	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	938	40	\$88,774	2.0%	100%	\$8.40	0.00
Electric	Miscellaneous	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	938	40	\$88,774	2.0%	100%	\$8.40	0.00
Electric	Miscellaneous	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	4,634	30	\$183	5.0%	N/A	\$1.99	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	137	25	\$2,219	75%	85%	\$1.64	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	137	25	\$2,219	75%	85%	\$1.64	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	232	25	\$2,219	75%	85%	\$0.97	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	232	25	\$2,219	75%	85%	\$0.97	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	266	20	\$82	45%	85%	\$0.03	40,783
Electric	Miscellaneous	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	266	20	\$131	45%	85%	\$0.06	74,887
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	236	25	\$2,541	15%	95%	\$1.09	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	236	25	\$2,541	15%	95%	\$1.09	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	488	25	\$2,541	15%	95%	\$0.53	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	488	25	\$2,541	15%	95%	\$0.53	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	218	25	\$2,117	95%	85%	\$0.99	0.00
Electric	Miscellaneous	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	218	25	\$2,117	95%	85%	\$0.99	128,674
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	New	199	10	\$1,028	0.0%	0%	\$0.88	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	New	199	10	\$1,028	0.0%	0%	\$0.88	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	New	536	10	\$1,028	0.0%	0%	\$0.33	0.00
Electric	Miscellaneous	Heat Pump	Window Film	Window Film	No Film	Per Building	New	536	10	\$1,028	0.0%	0%	\$0.33	0.00
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	695	25	\$10	80%	90%	\$0.00	262,663
Electric	Miscellaneous	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	695	25	\$10	80%	90%	\$0.00	486,876
Electric	Miscellaneous	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	2,336	8	\$636	75%	70%	\$0.05	0.00
Electric	Miscellaneous	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,940	15	\$808	62%	90%	\$0.05	0.00
Electric	Miscellaneous	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,940	15	\$1,282	62%	90%	\$0.09	0.00
Electric	Miscellaneous	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	980	8	\$494	90%	90%	\$0.10	0.00
Electric	Miscellaneous	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	980	8	\$784	90%	90%	\$0.16	0.00
Electric	Miscellaneous	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	820	8	\$228	5.0%	50%	\$0.06	0.00
Electric	Miscellaneous	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	1,596	17	\$1,084	75%	50%	\$0.08	0.00
Electric	Miscellaneous	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	808	8	\$41	25%	25%	\$0.01	2,068,159

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	808	8	\$65	25%	25%	\$0.02	2,289,014
Electric	Miscellaneous	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	2,336	8	\$636	75%	70%	\$0.05	0.00
Electric	Miscellaneous	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,940	15	\$808	62%	90%	\$0.05	0.00
Electric	Miscellaneous	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,940	15	\$1,282	62%	90%	\$0.09	0.00
Electric	Miscellaneous	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	980	8	\$494	90%	90%	\$0.10	0.00
Electric	Miscellaneous	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	980	8	\$784	90%	90%	\$0.16	0.00
Electric	Miscellaneous	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	820	8	\$228	5.0%	50%	\$0.06	0.00
Electric	Miscellaneous	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	1,596	17	\$1,084	75%	50%	\$0.08	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	540	10	\$225	5.0%	75%	\$0.07	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	540	10	\$356	5.0%	75%	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,128	8	\$7,488	20%	85%	\$0.36	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,128	8	\$7,488	20%	85%	\$0.36	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,202	8	\$7,488	20%	85%	\$0.29	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,202	8	\$7,488	20%	85%	\$0.29	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,096	8	\$5,616	20%	85%	\$0.36	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,096	8	\$5,616	20%	85%	\$0.36	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,901	8	\$5,616	20%	85%	\$0.29	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,901	8	\$5,616	20%	85%	\$0.29	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	138	6	\$50	10%	80%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	84	6	\$42	5.0%	80%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,688	13	\$22,278	50%	N/A	\$0.87	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,688	13	\$22,278	50%	N/A	\$0.87	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,694	13	\$22,313	50%	N/A	\$0.87	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,694	13	\$22,313	50%	N/A	\$0.87	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	825	13	\$430	100%	N/A	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	825	13	\$430	100%	N/A	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	827	13	\$431	100%	N/A	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	827	13	\$431	100%	N/A	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,520	13	\$2,921	100%	N/A	\$0.32	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,520	13	\$2,921	100%	N/A	\$0.32	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,717	13	\$2,917	100%	N/A	\$0.28	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,717	13	\$2,917	100%	N/A	\$0.28	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,517	13	\$1,191	100%	N/A	\$0.10	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,517	13	\$1,191	100%	N/A	\$0.10	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,719	13	\$1,194	100%	N/A	\$0.09	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,719	13	\$1,194	100%	N/A	\$0.09	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,459	8	\$494	75%	90%	\$0.04	61,334,676
Electric	Miscellaneous	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,459	8	\$784	75%	90%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,027	8	\$41	5.0%	25%	\$0.00	1,125,982
Electric	Miscellaneous	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,027	8	\$65	5.0%	25%	\$0.01	1,038,613

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,723	15	\$867	100%	N/A	\$0.08	0.00
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,250	15	\$3,696	95%	N/A	\$0.21	0.00
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,906	20	\$27,460	50%	N/A	\$1.58	0.00
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,159	13	\$-8.764	25%	N/A	\$-0.03	1,972,840
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,159	13	\$-8.764	25%	N/A	\$-0.03	2,106,482
Electric	Miscellaneous	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	522	15	\$17,353	100%	N/A	\$4.20	0.00
Electric	Miscellaneous	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	868	8	\$494	75%	90%	\$0.11	0.00
Electric	Miscellaneous	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	868	8	\$784	75%	90%	\$0.18	0.00
Electric	Miscellaneous	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	715	8	\$41	10%	25%	\$0.01	760,836
Electric	Miscellaneous	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	715	8	\$65	10%	25%	\$0.02	842,023
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	187	11	\$72	95%	65%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	187	11	\$72	95%	65%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	298	11	\$115	95%	65%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	298	11	\$115	95%	65%	\$0.06	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	37	13	\$32	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	37	13	\$32	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	59	13	\$51	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	59	13	\$51	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	658	10	\$225	5.0%	75%	\$0.06	127,287
Electric	Miscellaneous	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	658	10	\$356	5.0%	75%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,152	8	\$7,488	20%	85%	\$0.48	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,152	8	\$7,488	20%	85%	\$0.48	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,972	8	\$7,488	20%	85%	\$0.38	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,972	8	\$7,488	20%	85%	\$0.38	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,364	8	\$5,616	20%	85%	\$0.48	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,364	8	\$5,616	20%	85%	\$0.48	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,979	8	\$5,616	20%	85%	\$0.38	0.00
Electric	Miscellaneous	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,979	8	\$5,616	20%	85%	\$0.38	0.00
Electric	Miscellaneous	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	78	6	\$19	10%	80%	\$0.03	29,680
Electric	Miscellaneous	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	78	6	\$19	10%	80%	\$0.03	34,452
Electric	Miscellaneous	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	35	6	\$14	10%	80%	\$0.07	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	37	13	\$32	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	37	13	\$32	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	59	13	\$51	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	59	13	\$51	95%	95%	\$0.12	0.00
Electric	Miscellaneous	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,621	13	\$10,807	100%	N/A	\$0.43	0.00
Electric	Miscellaneous	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	3,621	13	\$10,807	100%	N/A	\$0.43	0.00
Electric	Miscellaneous	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	4,280	13	\$9,677	100%	N/A	\$0.32	0.00
Electric	Miscellaneous	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	4,280	13	\$9,677	100%	N/A	\$0.32	0.00
Electric	Miscellaneous	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	2,996	8	\$494	75%	90%	\$0.03	11,107,058
Electric	Miscellaneous	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	2,996	8	\$784	75%	90%	\$0.05	9,568,665

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,853	4	\$42	85%	N/A	\$-0.02	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,853	4	\$42	85%	N/A	\$-0.02	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	9,270	4	\$68	85%	N/A	\$-0.02	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	9,270	4	\$68	85%	N/A	\$-0.02	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,893	1	\$13	100%	N/A	\$0.01	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,893	1	\$13	100%	N/A	\$0.01	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	7,750	1	\$21	100%	N/A	\$0.01	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	7,750	1	\$21	100%	N/A	\$0.01	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,897	12	\$1,089	85%	N/A	\$0.01	21,438,482
Electric	Miscellaneous	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	9,341	12	\$1,727	85%	N/A	\$0.01	31,843,681
Electric	Miscellaneous	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	647	8	\$494	75%	90%	\$0.15	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	647	8	\$784	75%	90%	\$0.24	0.00
Electric	Miscellaneous	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	533	8	\$41	1.0%	25%	\$0.02	22,235
Electric	Miscellaneous	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	533	8	\$65	1.0%	25%	\$0.02	15,536
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	55	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	20	10	\$0.00	95%	75%	\$0.00	693,942

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	20	10	\$0.00	95%	75%	\$0.00	786,233
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	85	4	\$16	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	85	4	\$16	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.87	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	55	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	20	10	\$0.00	95%	75%	\$0.00	82,031
Electric	Miscellaneous	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	20	10	\$0.00	95%	75%	\$0.00	93,023
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	85	4	\$16	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	85	4	\$16	60%	90%	\$0.07	0.00
Electric	Miscellaneous	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	302	9	\$714	5.0%	N/A	\$0.43	0.00
Electric	Miscellaneous	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	Existing	385	9	\$714	5.0%	N/A	\$0.34	0.00
Electric	Miscellaneous	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	302	9	\$571	5.0%	N/A	\$0.35	0.00
Electric	Miscellaneous	Package Terminal AC	PTAC (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER	Standard Efficiency - 10.4 EER	Per Building	New	385	9	\$571	5.0%	N/A	\$0.27	0.00
Electric	Miscellaneous	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	158	15	\$3,067	45%	95%	\$2.53	0.00
Electric	Miscellaneous	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	201	15	\$3,067	45%	95%	\$1.99	0.00
Electric	Miscellaneous	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	71	12	\$5,450	1.0%	85%	\$11.47	0.00
Electric	Miscellaneous	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	90	12	\$5,450	1.0%	85%	\$9.01	0.00
Electric	Miscellaneous	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	158	40	\$88,774	2.0%	100%	\$49.70	0.00
Electric	Miscellaneous	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	201	40	\$88,774	2.0%	100%	\$39.04	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Package Terminal Ac	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	79	12	\$116	10%	60%	\$0.22	27,113
Electric	Miscellaneous	Package Terminal Ac	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	100	12	\$116	10%	60%	\$0.17	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$4,615	45%	65%	\$182.83	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$4,615	45%	65%	\$143.60	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.55	25	\$2,219	25%	85%	\$410.55	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.70	25	\$2,219	25%	85%	\$322.46	0.00
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	200	25	\$10	15%	90%	\$0.01	198,241
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	254	25	\$10	15%	90%	\$0.00	151,122
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	182	25	\$163	15%	25%	\$0.09	38,886
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	232	25	\$163	15%	25%	\$0.07	29,732
Electric	Miscellaneous	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	158	15	\$3,067	45%	95%	\$2.53	0.00
Electric	Miscellaneous	Package Terminal Ac	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	201	15	\$3,067	45%	95%	\$1.99	0.00
Electric	Miscellaneous	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	71	12	\$5,450	1.0%	85%	\$11.47	0.00
Electric	Miscellaneous	Package Terminal Ac	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	90	12	\$5,450	1.0%	85%	\$9.01	0.00
Electric	Miscellaneous	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	158	40	\$88,774	2.0%	100%	\$49.70	0.00
Electric	Miscellaneous	Package Terminal Ac	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	201	40	\$88,774	2.0%	100%	\$39.04	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.55	25	\$2,219	75%	85%	\$410.55	0.00
Electric	Miscellaneous	Package Terminal Ac	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.70	25	\$2,219	75%	85%	\$322.46	0.00
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	200	25	\$10	80%	90%	\$0.01	102,321
Electric	Miscellaneous	Package Terminal Ac	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	254	25	\$10	80%	90%	\$0.00	93,198
Electric	Miscellaneous	Package Terminal HP	PTHP (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER, 3.5 COP	Standard Efficiency - 10.2 EER, 3.0 COP	Per Building	Existing	143	9	\$2,191	100%	N/A	\$2.81	0.00
Electric	Miscellaneous	Package Terminal HP	PTHP (10,000 Btuh) - High Efficiency	High Efficiency - 12.8 EER, 3.5 COP	Standard Efficiency - 10.2 EER, 3.0 COP	Per Building	New	143	9	\$1,752	100%	N/A	\$2.24	0.00
Electric	Miscellaneous	Package Terminal Hp	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	860	15	\$3,067	45%	95%	\$0.47	0.00
Electric	Miscellaneous	Package Terminal Hp	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	770	12	\$5,450	1.0%	85%	\$1.06	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	635	40	\$88,774	2.0%	100%	\$12.40	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	635	40	\$88,774	2.0%	100%	\$12.40	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,086	40	\$88,774	2.0%	100%	\$7.25	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,086	40	\$88,774	2.0%	100%	\$7.25	0.00
Electric	Miscellaneous	Package Terminal Hp	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,284	12	\$116	10%	60%	\$0.01	200,723
Electric	Miscellaneous	Package Terminal Hp	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,284	12	\$116	10%	60%	\$0.01	296,525
Electric	Miscellaneous	Package Terminal Hp	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,013	25	\$4,615	45%	65%	\$0.23	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	431	25	\$2,219	25%	85%	\$0.52	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	7,189	25	\$8,238	15%	85%	\$0.12	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	948	25	\$2,541	15%	95%	\$0.27	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	252	25	\$20,251	10%	45%	\$8.16	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	252	25	\$20,251	10%	45%	\$8.16	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,732	25	\$20,251	10%	45%	\$0.76	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,732	25	\$20,251	10%	45%	\$0.76	0.00
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	756	25	\$10	15%	90%	\$0.00	267,449
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	756	25	\$10	15%	90%	\$0.00	395,097
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	944	25	\$163	15%	25%	\$0.02	72,534
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	944	25	\$163	15%	25%	\$0.02	107,154
Electric	Miscellaneous	Package Terminal Hp	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	860	15	\$3,067	45%	95%	\$0.47	0.00
Electric	Miscellaneous	Package Terminal Hp	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	770	12	\$5,450	1.0%	85%	\$1.06	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	635	40	\$88,774	2.0%	100%	\$12.40	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	635	40	\$88,774	2.0%	100%	\$12.40	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,086	40	\$88,774	2.0%	100%	\$7.25	0.00
Electric	Miscellaneous	Package Terminal Hp	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,086	40	\$88,774	2.0%	100%	\$7.25	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	431	25	\$2,219	75%	85%	\$0.52	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	948	25	\$2,541	15%	95%	\$0.27	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	252	25	\$2,117	95%	85%	\$0.85	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	252	25	\$2,117	95%	85%	\$0.85	0.00
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,732	25	\$2,117	95%	85%	\$0.08	516,407
Electric	Miscellaneous	Package Terminal Hp	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,732	25	\$2,117	95%	85%	\$0.08	516,407
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	756	25	\$10	80%	90%	\$0.00	166,639

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Package Terminal Hp	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	756	25	\$10	80%	90%	\$0.00	210,278
Electric	Miscellaneous	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	98	6	\$123	100%	N/A	\$0.31	0.00
Electric	Miscellaneous	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	98	6	\$123	100%	N/A	\$0.31	133
Electric	Miscellaneous	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	98	6	\$123	100%	N/A	\$0.31	193
Electric	Miscellaneous	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$149	100%	N/A	\$0.01	587,109
Electric	Miscellaneous	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$149	100%	N/A	\$0.01	3,086,048
Electric	Miscellaneous	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$500	75%	N/A	\$0.01	5,880,922
Electric	Miscellaneous	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$500	75%	N/A	\$0.01	31,272,214
Electric	Miscellaneous	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$149	75%	25%	\$0.00	1,895,219
Electric	Miscellaneous	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$149	75%	25%	\$0.00	10,736,388
Electric	Miscellaneous	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$149	100%	N/A	\$0.01	129,576
Electric	Miscellaneous	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$149	100%	N/A	\$0.01	579,429
Electric	Miscellaneous	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$500	75%	N/A	\$0.01	1,260,572
Electric	Miscellaneous	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$500	75%	N/A	\$0.01	5,631,875
Electric	Miscellaneous	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	89	6	\$13	100%	N/A	\$0.04	28,786
Electric	Miscellaneous	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	89	6	\$13	100%	N/A	\$0.04	49,521
Electric	Miscellaneous	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	89	6	\$13	100%	N/A	\$0.04	0.00
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	311	8	\$26	5.0%	75%	\$0.02	473,427
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	311	8	\$26	5.0%	75%	\$0.02	473,427
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	311	8	\$26	5.0%	75%	\$0.02	530,155
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	311	8	\$26	5.0%	75%	\$0.02	530,155
Electric	Miscellaneous	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	268	15	\$64	2.5%	50%	\$0.03	136,085
Electric	Miscellaneous	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	268	15	\$64	2.5%	50%	\$0.03	152,392
Electric	Miscellaneous	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	185	15	\$20	2.5%	90%	\$0.01	169,248
Electric	Miscellaneous	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	185	15	\$20	2.5%	90%	\$0.01	189,528
Electric	Miscellaneous	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	26	15	\$17	2.5%	90%	\$0.09	0.00
Electric	Miscellaneous	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	26	15	\$17	2.5%	90%	\$0.09	0.00
Electric	Miscellaneous	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	26	15	\$17	2.5%	90%	\$0.09	0.00
Electric	Miscellaneous	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	26	15	\$17	2.5%	90%	\$0.09	0.00
Electric	Miscellaneous	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	Existing	181	10	\$150	1.0%	80%	\$0.14	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	246	10	\$204	1.0%	80%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	Existing	57	10	\$3,299	1.0%	70%	\$9.70	0.00
Electric	Miscellaneous	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	26	8	\$2	2.5%	95%	\$0.02	25,718
Electric	Miscellaneous	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	26	8	\$2	2.5%	95%	\$0.02	28,800
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	128	5	\$20	5.0%	90%	\$0.05	233,516
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	128	5	\$20	5.0%	90%	\$0.05	233,516
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	128	5	\$20	5.0%	90%	\$0.05	261,496
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	128	5	\$20	5.0%	90%	\$0.05	261,496
Electric	Miscellaneous	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	Existing	225	3	\$35	10%	90%	\$0.07	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	311	8	\$26	5.0%	20%	\$0.02	16,948
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	311	8	\$26	5.0%	20%	\$0.02	16,948
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	311	8	\$26	5.0%	20%	\$0.02	14,774
Electric	Miscellaneous	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	311	8	\$26	5.0%	20%	\$0.02	14,774
Electric	Miscellaneous	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	197	15	\$48	2.5%	50%	\$0.03	11,373
Electric	Miscellaneous	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	197	15	\$48	2.5%	50%	\$0.03	13,105
Electric	Miscellaneous	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	133	10	\$110	1.0%	80%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	180	10	\$149	1.0%	80%	\$0.14	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	New	42	10	\$3,299	1.0%	70%	\$13.22	0.00
Electric	Miscellaneous	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	19	8	\$1	2.5%	95%	\$0.02	2,205
Electric	Miscellaneous	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	19	8	\$1	2.5%	95%	\$0.02	2,530
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	14	15	\$13	35%	80%	\$0.12	0.00
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	128	5	\$20	5.0%	90%	\$0.05	31,401
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	128	5	\$20	5.0%	90%	\$0.05	31,401
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	128	5	\$20	5.0%	90%	\$0.05	27,373
Electric	Miscellaneous	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	128	5	\$20	5.0%	90%	\$0.05	27,373
Electric	Miscellaneous	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	New	82	3	\$9	5.0%	90%	\$0.05	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	24	4	\$18	15%	80%	\$0.26	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	52	15	\$57	2.5%	95%	\$0.14	0.00
Electric	Miscellaneous	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	165	20	\$450	100%	N/A	\$0.31	0.00
Electric	Miscellaneous	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	185	20	\$603	100%	N/A	\$0.36	0.00
Electric	Miscellaneous	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	145	20	\$35	100%	N/A	\$0.03	631,299
Electric	Miscellaneous	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	145	20	\$35	100%	N/A	\$0.03	651,146
Electric	Miscellaneous	Refrigerator	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	46	20	\$15	100%	N/A	\$0.04	0.00
Electric	Miscellaneous	Refrigerator	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,135	20	\$120	8.8%	100%	\$0.01	3,132,224
Electric	Miscellaneous	Refrigerator	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,135	20	\$120	8.8%	100%	\$0.01	3,132,224
Electric	Miscellaneous	Refrigerator	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,158	20	\$116	8.8%	100%	\$0.01	3,621,158
Electric	Miscellaneous	Refrigerator	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,158	20	\$116	8.8%	100%	\$0.01	3,621,158
Electric	Miscellaneous	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	165	20	\$450	100%	N/A	\$0.31	0.00
Electric	Miscellaneous	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	185	20	\$603	100%	N/A	\$0.36	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	145	20	\$35	100%	N/A	\$0.03	278,656
Electric	Miscellaneous	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	145	20	\$35	100%	N/A	\$0.03	297,464
Electric	Miscellaneous	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	46	20	\$15	100%	N/A	\$0.04	0.00
Electric	Miscellaneous	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	169	15	\$3,067	45%	95%	\$2.36	0.00
Electric	Miscellaneous	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	216	15	\$3,067	45%	95%	\$1.85	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	311	15	\$22,912	2.5%	65%	\$9.62	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	396	15	\$22,912	2.5%	65%	\$7.56	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	311	15	\$18,924	2.5%	65%	\$7.95	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	396	15	\$18,924	2.5%	65%	\$6.24	0.00
Electric	Miscellaneous	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	76	12	\$5,450	1.0%	85%	\$10.70	0.00
Electric	Miscellaneous	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	97	12	\$5,450	1.0%	85%	\$8.41	0.00
Electric	Miscellaneous	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	169	40	\$88,774	2.0%	100%	\$46.39	0.00
Electric	Miscellaneous	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	216	40	\$88,774	2.0%	100%	\$36.43	0.00
Electric	Miscellaneous	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	84	12	\$116	10%	60%	\$0.21	0.00
Electric	Miscellaneous	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	108	12	\$116	10%	60%	\$0.16	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$4,615	45%	65%	\$170.63	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$4,615	45%	65%	\$134.02	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.59	25	\$2,219	25%	85%	\$383.16	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.75	25	\$2,219	25%	85%	\$300.94	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	202	9	\$49	100%	N/A	\$0.05	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	202	9	\$49	100%	N/A	\$0.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	214	25	\$10	15%	90%	\$0.00	0.00
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	272	25	\$10	15%	90%	\$0.00	0.00
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	195	25	\$163	15%	25%	\$0.08	0.00
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	248	25	\$163	15%	25%	\$0.07	0.00
Electric	Miscellaneous	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	169	15	\$3,067	45%	95%	\$2.36	0.00
Electric	Miscellaneous	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	216	15	\$3,067	45%	95%	\$1.85	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	311	15	\$18,329	2.5%	65%	\$7.70	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	396	15	\$18,329	2.5%	65%	\$6.04	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	311	15	\$15,140	2.5%	65%	\$6.36	0.00
Electric	Miscellaneous	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	396	15	\$15,140	2.5%	65%	\$4.99	0.00
Electric	Miscellaneous	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	76	12	\$5,450	1.0%	85%	\$10.70	0.00
Electric	Miscellaneous	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	97	12	\$5,450	1.0%	85%	\$8.41	0.00
Electric	Miscellaneous	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	169	40	\$88,774	2.0%	100%	\$46.39	0.00
Electric	Miscellaneous	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	216	40	\$88,774	2.0%	100%	\$36.43	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.59	25	\$2,219	75%	85%	\$383.16	0.00
Electric	Miscellaneous	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.75	25	\$2,219	75%	85%	\$300.94	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	158	9	\$49	100%	N/A	\$0.06	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	202	9	\$49	100%	N/A	\$0.05	0.00
Electric	Miscellaneous	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	202	9	\$49	100%	N/A	\$0.05	0.00
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	214	25	\$10	80%	90%	\$0.00	0.00
Electric	Miscellaneous	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	272	25	\$10	80%	90%	\$0.00	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	1,002	15	\$18,932	2.5%	65%	\$2.47	0.00
Electric	Miscellaneous	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	72	12	\$5,450	1.0%	85%	\$11.26	0.00
Electric	Miscellaneous	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	161	12	\$116	10%	60%	\$0.11	0.00
Electric	Miscellaneous	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	187	25	\$4,615	45%	65%	\$2.50	0.00
Electric	Miscellaneous	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	40	25	\$2,219	25%	85%	\$5.62	0.00
Electric	Miscellaneous	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	564	25	\$8,238	15%	85%	\$1.49	0.00
Electric	Miscellaneous	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	72	25	\$2,541	15%	95%	\$3.58	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	195	25	\$20,251	10%	45%	\$10.54	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	195	25	\$20,251	10%	45%	\$10.54	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	513	25	\$20,251	10%	45%	\$4.02	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	513	25	\$20,251	10%	45%	\$4.02	0.00
Electric	Miscellaneous	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	1,002	15	\$12,983	2.5%	65%	\$1.69	0.00
Electric	Miscellaneous	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	72	12	\$5,450	1.0%	85%	\$11.26	0.00
Electric	Miscellaneous	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	40	25	\$2,219	75%	85%	\$5.62	0.00
Electric	Miscellaneous	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	72	25	\$2,541	15%	95%	\$3.58	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	195	25	\$2,117	95%	85%	\$1.10	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	195	25	\$2,117	95%	85%	\$1.10	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	513	25	\$2,117	95%	85%	\$0.42	0.00
Electric	Miscellaneous	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	513	25	\$2,117	95%	85%	\$0.42	0.00
Electric	Miscellaneous	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	28	9	\$3	100%	N/A	\$0.02	683,973
Electric	Miscellaneous	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	28	9	\$3	100%	N/A	\$0.02	724,794
Electric	Miscellaneous	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	Existing	96	4	\$361	10%	65%	\$1.32	0.00
Electric	Miscellaneous	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	28	9	\$3	100%	N/A	\$0.02	92,869
Electric	Miscellaneous	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	28	9	\$3	100%	N/A	\$0.02	103,674
Electric	Miscellaneous	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	New	95	4	\$361	10%	65%	\$1.33	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	60	15	\$219	50%	95%	\$0.48	0.00
Electric	Miscellaneous	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	901	15	\$26,640	15%	70%	\$3.86	0.00
Electric	Miscellaneous	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	450	5	\$547	75%	75%	\$0.35	0.00
Electric	Miscellaneous	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	75	18	\$2,103	45%	85%	\$3.31	0.00
Electric	Miscellaneous	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	450	14	\$15,073	5.0%	95%	\$4.56	0.00
Electric	Miscellaneous	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	135	12	\$5,450	1.0%	85%	\$6.05	0.00
Electric	Miscellaneous	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	300	12	\$116	10%	60%	\$0.06	0.00
Electric	Miscellaneous	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	349	25	\$4,615	45%	65%	\$1.34	0.00
Electric	Miscellaneous	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	74	25	\$2,219	25%	85%	\$3.02	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	90	20	\$469	45%	60%	\$0.58	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	90	20	\$745	45%	60%	\$0.93	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	54	20	\$82	45%	85%	\$0.17	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	54	20	\$131	45%	85%	\$0.27	0.00
Electric	Miscellaneous	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,049	25	\$8,238	15%	85%	\$0.80	0.00
Electric	Miscellaneous	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	134	25	\$2,541	15%	95%	\$1.92	0.00
Electric	Miscellaneous	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	955	25	\$20,251	10%	45%	\$2.16	0.00
Electric	Miscellaneous	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	375	7	\$1,727	90%	95%	\$1.02	0.00
Electric	Miscellaneous	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	98	7	\$6,485	95%	95%	\$14.59	0.00
Electric	Miscellaneous	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	450	5	\$547	25%	25%	\$0.35	0.00
Electric	Miscellaneous	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	450	14	\$15,073	5.0%	95%	\$4.56	0.00
Electric	Miscellaneous	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	135	12	\$5,450	1.0%	85%	\$6.05	0.00
Electric	Miscellaneous	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	74	25	\$2,219	75%	85%	\$3.02	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	54	20	\$82	45%	85%	\$0.17	0.00
Electric	Miscellaneous	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	54	20	\$131	45%	85%	\$0.27	0.00
Electric	Miscellaneous	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	134	25	\$2,541	15%	95%	\$1.92	0.00
Electric	Miscellaneous	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	364	25	\$2,117	95%	85%	\$0.59	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	525	10	\$72	100%	N/A	\$0.02	7,147,817
Electric	Miscellaneous	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	525	10	\$72	100%	N/A	\$0.02	7,207,044
Electric	Miscellaneous	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	525	10	\$72	100%	N/A	\$0.02	1,315,071
Electric	Miscellaneous	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	525	10	\$72	100%	N/A	\$0.02	1,464,772
Electric	Miscellaneous	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	5,279	10	\$1,074	5.0%	90%	\$0.03	5,162,160
Electric	Miscellaneous	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	5,279	10	\$1,074	5.0%	90%	\$0.03	5,421,535
Electric	Miscellaneous	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	7,918	15	\$26,640	15%	70%	\$0.44	0.00
Electric	Miscellaneous	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	93	18	\$200	95%	65%	\$0.25	0.00
Electric	Miscellaneous	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	269	15	\$57	95%	90%	\$0.03	5,046,140
Electric	Miscellaneous	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	269	15	\$57	95%	90%	\$0.03	5,299,686
Electric	Miscellaneous	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	6,730	20	\$975	55%	65%	\$0.02	58,039,418
Electric	Miscellaneous	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	6,730	20	\$975	55%	65%	\$0.02	60,955,642
Electric	Miscellaneous	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	154	7	\$43	65%	25%	\$0.06	0.00
Electric	Miscellaneous	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	Existing	422	18	\$1,704	5.0%	85%	\$0.48	0.00
Electric	Miscellaneous	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	5,279	10	\$1,074	5.0%	90%	\$0.03	555,219
Electric	Miscellaneous	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	5,279	10	\$1,074	5.0%	90%	\$0.03	749,193
Electric	Miscellaneous	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	559	18	\$1,199	95%	65%	\$0.25	0.00
Electric	Miscellaneous	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	269	15	\$57	95%	90%	\$0.03	528,831

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	Motor - CEE Premium-Efficiency Plus	NEMA Efficiency Motors	Per Building	New	269	15	\$57	95%	90%	\$0.03	716,709
Electric	Miscellaneous	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	6,730	20	\$975	55%	45%	\$0.02	3,991,388
Electric	Miscellaneous	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	6,730	20	\$975	55%	45%	\$0.02	4,929,184
Electric	Miscellaneous	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	New	422	18	\$1,704	5.0%	85%	\$0.48	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	37	9	\$14	1.0%	95%	\$0.07	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$6	0.5%	95%	\$0.05	274
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$6	0.5%	95%	\$0.05	305
Electric	Miscellaneous	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	63	10	\$2,434	55%	95%	\$6.55	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	3	12	\$8	75%	35%	\$0.42	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$2	1.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$2	1.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	12	12	\$50	75%	75%	\$0.60	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	252	25	\$1,600	2.5%	95%	\$0.64	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	48	9	\$0.00	95%	75%	\$0.00	214,912
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	48	9	\$0.87	95%	75%	\$0.00	238,962
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	20	9	\$0.00	95%	50%	\$0.00	58,995
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	20	9	\$0.87	95%	50%	\$0.01	54,587
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$7	95%	25%	\$0.17	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$10	95%	25%	\$0.25	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	429	4	\$129	95%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	60	10	\$6	95%	85%	\$0.02	250,977
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	60	10	\$6	95%	85%	\$0.02	250,977
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	96	10	\$9	95%	85%	\$0.02	443,143
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	96	10	\$9	95%	85%	\$0.02	443,143
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	48	10	\$15	95%	25%	\$0.05	59,533
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	48	10	\$15	95%	25%	\$0.05	59,533
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	77	10	\$25	95%	25%	\$0.06	105,116
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	77	10	\$25	95%	25%	\$0.06	105,116
Electric	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	31	10	\$106	75%	95%	\$0.57	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	31	10	\$168	75%	95%	\$0.90	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	144	10	\$89	2.5%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	144	10	\$141	2.5%	95%	\$0.17	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	754	15	\$645	75%	N/A	\$0.15	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	745	15	\$386	75%	N/A	\$0.11	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	37	9	\$14	1.0%	95%	\$0.07	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$6	0.5%	95%	\$0.05	23
Electric	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$6	0.5%	95%	\$0.05	27
Electric	Miscellaneous	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	62	10	\$2,434	55%	95%	\$6.60	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	3	12	\$8	75%	35%	\$0.42	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$2	1.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$2	1.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	1.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	250	25	\$1,280	2.5%	95%	\$0.52	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	48	9	\$0.00	95%	75%	\$0.00	21,662
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	48	9	\$0.87	95%	75%	\$0.00	18,143
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	19	9	\$0.00	95%	50%	\$0.00	5,946

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	19	9	\$0.87	95%	50%	\$0.01	4,144
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	429	4	\$129	95%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	60	10	\$6	95%	85%	\$0.02	25,509
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	60	10	\$6	95%	85%	\$0.02	25,509
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	96	10	\$9	95%	85%	\$0.02	33,927
Electric	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	96	10	\$9	95%	85%	\$0.02	33,927
Electric	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	31	10	\$106	75%	95%	\$0.57	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	31	10	\$168	75%	95%	\$0.91	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	142	10	\$89	2.5%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	142	10	\$141	2.5%	95%	\$0.17	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	754	15	\$645	75%	N/A	\$0.15	0.00
Electric	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	745	15	\$386	75%	N/A	\$0.11	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	37	9	\$14	1.0%	95%	\$0.07	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$6	0.5%	95%	\$0.05	621
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$6	0.5%	95%	\$0.05	691
Electric	Miscellaneous	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	66	10	\$2,434	25%	95%	\$6.26	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	3	12	\$8	75%	35%	\$0.42	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.08	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$2	5.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$2	5.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	13	12	\$50	75%	75%	\$0.58	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	264	25	\$1,600	2.5%	95%	\$0.62	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	51	9	\$0.00	95%	75%	\$0.00	508,882
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	51	9	\$0.87	95%	75%	\$0.00	565,863
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	21	9	\$0.00	95%	50%	\$0.00	139,693
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	21	9	\$0.87	95%	50%	\$0.01	129,263
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$7	95%	25%	\$0.16	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$10	95%	25%	\$0.24	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	429	4	\$129	95%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	60	10	\$6	95%	85%	\$0.02	568,656
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	60	10	\$6	95%	85%	\$0.02	568,656
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	96	10	\$9	95%	85%	\$0.02	1,004,116
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	96	10	\$9	95%	85%	\$0.02	1,004,116
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	48	10	\$15	95%	25%	\$0.05	134,889
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	48	10	\$15	95%	25%	\$0.05	134,889
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	77	10	\$25	95%	25%	\$0.06	238,183
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	77	10	\$25	95%	25%	\$0.06	238,183
Electric	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	33	10	\$106	75%	95%	\$0.55	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	33	10	\$168	75%	95%	\$0.87	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	150	10	\$89	2.5%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	150	10	\$141	2.5%	95%	\$0.16	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	697	15	\$3,311	75%	N/A	\$0.69	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	40	15	\$144	100%	N/A	\$0.46	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	37	9	\$14	1.0%	95%	\$0.07	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$6	0.5%	95%	\$0.05	68
Electric	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$6	0.5%	95%	\$0.05	80
Electric	Miscellaneous	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	64	10	\$2,434	25%	95%	\$6.46	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	3	12	\$8	75%	35%	\$0.42	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.08	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$2	5.0%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$2	5.0%	95%	\$0.10	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	4	12	\$2	5.0%	95%	\$0.09	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	256	25	\$1,280	2.5%	95%	\$0.51	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	49	9	\$0.00	95%	75%	\$0.00	64,935
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	49	9	\$0.87	95%	75%	\$0.00	55,120
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	20	9	\$0.00	95%	50%	\$0.00	17,825
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	20	9	\$0.87	95%	50%	\$0.01	12,591
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	429	4	\$129	95%	95%	\$0.11	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	60	10	\$6	95%	85%	\$0.02	74,803
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	60	10	\$6	95%	85%	\$0.02	74,803
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	96	10	\$9	95%	85%	\$0.02	100,831
Electric	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	96	10	\$9	95%	85%	\$0.02	100,831
Electric	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	32	10	\$106	75%	95%	\$0.56	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	32	10	\$168	75%	95%	\$0.89	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	146	10	\$89	2.5%	95%	\$0.10	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	146	10	\$141	2.5%	95%	\$0.17	0.00
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	697	15	\$3,311	75%	N/A	\$0.69	129
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	697	15	\$3,311	75%	N/A	\$0.69	284
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	40	15	\$144	100%	N/A	\$0.46	-218,1897
Electric	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	40	15	\$144	100%	N/A	\$0.46	-24,34404
Electric	Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	84	4	\$9	100%	N/A	\$0.04	66,700
Electric	Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	84	4	\$9	100%	N/A	\$0.04	73,452

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	84	4	\$9	100%	N/A	\$0.04	19,597
Electric	Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	84	4	\$9	100%	N/A	\$0.04	22,950
Electric	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	1,644	12	\$930	40%	60%	\$0.08	0.00
Electric	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	1,644	12	\$930	40%	60%	\$0.08	0.00
Electric	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	1,644	12	\$930	40%	60%	\$0.08	0.00
Electric	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	1,644	12	\$930	40%	60%	\$0.08	0.00
Electric	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	420	12	\$1,097	40%	70%	\$0.39	0.00
Electric	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	420	12	\$1,097	40%	70%	\$0.39	0.00
Electric	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	420	12	\$1,097	40%	70%	\$0.39	0.00
Electric	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	420	12	\$1,097	40%	70%	\$0.39	0.00
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	943	12	\$229	40%	45%	\$0.04	310,066
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	943	12	\$229	40%	45%	\$0.04	310,066
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	943	12	\$229	40%	45%	\$0.04	731,098
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	943	12	\$229	40%	45%	\$0.04	731,098
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	4,630	12	\$2,608	39%	75%	\$0.08	0.00
Electric	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	1,644	12	\$930	40%	60%	\$0.08	0.00
Electric	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	420	12	\$1,097	40%	70%	\$0.39	0.00
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	943	12	\$229	40%	45%	\$0.04	41,438
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	943	12	\$229	40%	45%	\$0.04	41,438
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	943	12	\$229	40%	45%	\$0.04	75,949
Electric	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	943	12	\$229	40%	45%	\$0.04	75,949
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	2,680	12	\$1,713	35%	85%	\$0.10	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	2,680	12	\$1,713	35%	85%	\$0.10	0.00
Electric	Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	4,630	12	\$2,608	39%	75%	\$0.08	0.00
Electric	Restaurant	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,206	15	\$1,455	45%	95%	\$0.16	0.00
Electric	Restaurant	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,445	15	\$1,455	45%	95%	\$0.13	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	382	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	976	15	\$754	100%	N/A	\$0.10	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	1,809	10	\$4,716	10%	50%	\$0.44	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	2,167	10	\$4,716	10%	50%	\$0.37	0.00
Electric	Restaurant	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	301	18	\$998	45%	85%	\$0.39	0.00
Electric	Restaurant	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	361	18	\$998	45%	85%	\$0.33	0.00
Electric	Restaurant	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	8,086	15	\$-15809.607	35%	N/A	\$-0.33	3,933,054
Electric	Restaurant	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	8,086	15	\$-15809.607	35%	N/A	\$-0.33	5,675,929
Electric	Restaurant	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	542	12	\$5,449	65%	85%	\$1.51	0.00
Electric	Restaurant	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	650	12	\$5,449	65%	85%	\$1.26	0.00
Electric	Restaurant	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,206	40	\$42,133	2.0%	100%	\$3.10	0.00
Electric	Restaurant	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,445	40	\$42,133	2.0%	100%	\$2.59	0.00
Electric	Restaurant	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	603	12	\$169	10%	60%	\$0.04	163,132
Electric	Restaurant	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	722	12	\$169	10%	60%	\$0.04	144,319
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	19	25	\$2,190	45%	65%	\$11.40	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	23	25	\$2,190	45%	65%	\$9.52	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$1,053	25%	85%	\$25.60	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	5	25	\$1,053	25%	85%	\$21.37	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	361	20	\$437	45%	60%	\$0.14	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	433	20	\$478	45%	60%	\$0.12	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	217	20	\$76	45%	85%	\$0.04	376,984
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	260	20	\$83	45%	85%	\$0.04	330,219
Electric	Restaurant	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,508	7	\$819	90%	95%	\$0.12	0.00
Electric	Restaurant	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,806	7	\$819	90%	95%	\$0.10	6,168,349
Electric	Restaurant	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,206	5	\$1,330	95%	50%	\$0.32	0.00
Electric	Restaurant	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,445	5	\$1,330	95%	50%	\$0.27	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	681	10	\$1,496	35%	70%	\$0.37	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	681	10	\$1,496	35%	70%	\$0.37	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,123	10	\$1,496	35%	70%	\$0.23	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,123	10	\$1,496	35%	70%	\$0.23	0.00
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,522	25	\$15	15%	90%	\$0.00	1,206,228
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,823	25	\$15	15%	90%	\$0.00	1,059,774
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,388	25	\$237	15%	25%	\$0.02	237,322
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,663	25	\$237	15%	25%	\$0.01	208,508
Electric	Restaurant	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	369	7	\$3,077	95%	95%	\$1.85	0.00
Electric	Restaurant	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	436	7	\$3,077	95%	95%	\$1.56	0.00
Electric	Restaurant	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,126	15	\$1,455	45%	95%	\$0.17	0.00
Electric	Restaurant	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,330	15	\$1,455	45%	95%	\$0.14	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	382	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Restaurant	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	976	15	\$604	100%	N/A	\$0.08	142,942
Electric	Restaurant	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	976	15	\$604	100%	N/A	\$0.08	157,901
Electric	Restaurant	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	8,086	15	\$-11525.421	35%	N/A	\$-0.24	1,411,378
Electric	Restaurant	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	8,086	15	\$-11525.421	35%	N/A	\$-0.24	2,037,763

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	507	12	\$5,449	65%	85%	\$1.61	0.00
Electric	Restaurant	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	598	12	\$5,449	65%	85%	\$1.37	0.00
Electric	Restaurant	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,126	40	\$42,133	2.0%	100%	\$3.32	0.00
Electric	Restaurant	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,330	40	\$42,133	2.0%	100%	\$2.81	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	3	25	\$1,053	75%	85%	\$27.41	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	4	25	\$1,053	75%	85%	\$23.21	0.00
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	202	20	\$76	45%	85%	\$0.04	39,869
Electric	Restaurant	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	239	20	\$83	45%	85%	\$0.04	29,330
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	681	10	\$1,496	0.0%	0%	\$0.37	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	681	10	\$1,496	0.0%	0%	\$0.37	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,123	10	\$1,496	0.0%	0%	\$0.23	0.00
Electric	Restaurant	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,123	10	\$1,496	0.0%	0%	\$0.23	0.00
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,421	25	\$15	80%	90%	\$0.00	732,438
Electric	Restaurant	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,678	25	\$15	80%	90%	\$0.00	538,823
Electric	Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	2	6	\$0.00	100%	N/A	\$0.00	16,540
Electric	Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	2	6	\$0.00	100%	N/A	\$0.00	16,640
Electric	Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	2	6	\$0.00	100%	N/A	\$0.00	2,482
Electric	Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	2	6	\$0.00	100%	N/A	\$0.00	2,943
Electric	Restaurant	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	11	4	\$12	100%	N/A	\$0.40	0.00
Electric	Restaurant	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	11	4	\$12	100%	N/A	\$0.40	2
Electric	Restaurant	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	11	4	\$12	100%	N/A	\$0.40	3
Electric	Restaurant	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	7	20	\$0.83	100%	N/A	\$0.01	0.00
Electric	Restaurant	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	20	20	\$0.41	100%	N/A	\$0.00	47,592
Electric	Restaurant	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	20	20	\$0.41	100%	N/A	\$0.00	-877.08624
Electric	Restaurant	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	137	20	\$19	8.8%	100%	\$0.02	103,621
Electric	Restaurant	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	137	20	\$19	8.8%	100%	\$0.02	103,621
Electric	Restaurant	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	162	20	\$19	8.8%	100%	\$0.01	114,393
Electric	Restaurant	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	162	20	\$19	8.8%	100%	\$0.01	114,393
Electric	Restaurant	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	7	20	\$0.83	100%	N/A	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	20	20	\$0.41	100%	N/A	\$0.00	16,514
Electric	Restaurant	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	20	20	\$0.41	100%	N/A	\$0.00	-113.885256
Electric	Restaurant	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	701	15	\$2,810	100%	N/A	\$0.52	0.00
Electric	Restaurant	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	1,480	15	\$5,620	100%	N/A	\$0.50	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,067	15	\$1,455	45%	95%	\$0.18	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,067	15	\$1,455	45%	95%	\$0.18	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,239	15	\$1,455	45%	95%	\$0.15	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,239	15	\$1,455	45%	95%	\$0.15	0.00
Electric	Restaurant	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	451	18	\$998	45%	85%	\$0.26	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	848	14	\$7,153	5.0%	95%	\$1.15	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	848	14	\$7,153	5.0%	95%	\$1.15	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,107	14	\$7,153	5.0%	95%	\$0.88	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,107	14	\$7,153	5.0%	95%	\$0.88	0.00
Electric	Restaurant	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	812	12	\$5,449	65%	85%	\$1.01	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,067	40	\$42,133	2.0%	100%	\$3.50	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,067	40	\$42,133	2.0%	100%	\$3.50	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,239	40	\$42,133	2.0%	100%	\$3.02	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,239	40	\$42,133	2.0%	100%	\$3.02	0.00
Electric	Restaurant	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	5,103	30	\$66,611	5.0%	N/A	\$3.05	0.00
Electric	Restaurant	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,353	12	\$169	10%	60%	\$0.02	26,962
Electric	Restaurant	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,353	12	\$169	10%	60%	\$0.02	68,439
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	674	25	\$2,190	45%	65%	\$0.33	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	674	25	\$2,190	45%	65%	\$0.33	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	871	25	\$2,190	45%	65%	\$0.26	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	871	25	\$2,190	45%	65%	\$0.26	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	144	25	\$1,053	25%	85%	\$0.74	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	144	25	\$1,053	25%	85%	\$0.74	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	186	25	\$1,053	25%	85%	\$0.58	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	186	25	\$1,053	25%	85%	\$0.58	0.00
Electric	Restaurant	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	541	20	\$437	45%	60%	\$0.09	42,852
Electric	Restaurant	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	541	20	\$478	45%	60%	\$0.10	0.00
Electric	Restaurant	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	324	20	\$76	45%	85%	\$0.03	41,066
Electric	Restaurant	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	324	20	\$83	45%	85%	\$0.03	103,975
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,153	25	\$3,909	15%	85%	\$0.35	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,153	25	\$3,909	15%	85%	\$0.35	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,729	25	\$3,909	15%	85%	\$0.23	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,729	25	\$3,909	15%	85%	\$0.23	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	227	25	\$1,206	15%	95%	\$0.54	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	227	25	\$1,206	15%	95%	\$0.54	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	338	25	\$1,206	15%	95%	\$0.36	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	338	25	\$1,206	15%	95%	\$0.36	0.00
Electric	Restaurant	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,879	25	\$9,611	10%	45%	\$0.34	0.00
Electric	Restaurant	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,256	7	\$819	90%	95%	\$0.08	767,101
Electric	Restaurant	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,256	7	\$819	90%	95%	\$0.08	1,942,206
Electric	Restaurant	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	1,805	3	\$1,330	95%	50%	\$0.34	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	403	10	\$1,496	35%	70%	\$0.63	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	403	10	\$1,496	35%	70%	\$0.63	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	771	10	\$1,496	35%	70%	\$0.33	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	771	10	\$1,496	35%	70%	\$0.33	0.00
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,120	25	\$15	15%	90%	\$0.00	64,282
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,120	25	\$15	15%	90%	\$0.00	162,756
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,232	25	\$237	15%	25%	\$0.02	15,375
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,232	25	\$237	15%	25%	\$0.02	38,753
Electric	Restaurant	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	701	15	\$2,248	100%	N/A	\$0.42	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,480	15	\$4,496	100%	N/A	\$0.40	41
Electric	Restaurant	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,480	15	\$4,496	100%	N/A	\$0.40	58
Electric	Restaurant	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	546	7	\$3,077	95%	95%	\$1.25	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	985	15	\$1,455	45%	95%	\$0.19	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	985	15	\$1,455	45%	95%	\$0.19	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,144	15	\$1,455	45%	95%	\$0.17	0.00
Electric	Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,144	15	\$1,455	45%	95%	\$0.17	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	783	14	\$7,153	5.0%	95%	\$1.24	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	783	14	\$7,153	5.0%	95%	\$1.24	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,022	14	\$7,153	5.0%	95%	\$0.95	0.00
Electric	Restaurant	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,022	14	\$7,153	5.0%	95%	\$0.95	0.00
Electric	Restaurant	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	750	12	\$5,449	65%	85%	\$1.09	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	985	40	\$42,133	2.0%	100%	\$3.80	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	985	40	\$42,133	2.0%	100%	\$3.80	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,144	40	\$42,133	2.0%	100%	\$3.27	0.00
Electric	Restaurant	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,144	40	\$42,133	2.0%	100%	\$3.27	0.00
Electric	Restaurant	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	5,103	30	\$85,585	5.0%	N/A	\$1.55	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	133	25	\$1,053	75%	85%	\$0.80	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	133	25	\$1,053	75%	85%	\$0.80	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	172	25	\$1,053	75%	85%	\$0.62	0.00
Electric	Restaurant	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	172	25	\$1,053	75%	85%	\$0.62	0.00
Electric	Restaurant	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	300	20	\$76	45%	85%	\$0.03	4,456
Electric	Restaurant	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	300	20	\$83	45%	85%	\$0.03	9,639
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	210	25	\$1,206	15%	95%	\$0.58	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	210	25	\$1,206	15%	95%	\$0.58	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	312	25	\$1,206	15%	95%	\$0.39	0.00
Electric	Restaurant	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	312	25	\$1,206	15%	95%	\$0.39	0.00
Electric	Restaurant	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	245	25	\$1,004	95%	85%	\$0.42	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	New	403	10	\$1,496	0.0%	0%	\$0.63	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	New	403	10	\$1,496	0.0%	0%	\$0.63	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	New	771	10	\$1,496	0.0%	0%	\$0.33	0.00
Electric	Restaurant	Heat Pump	Window Film	Window Film	No Film	Per Building	New	771	10	\$1,496	0.0%	0%	\$0.33	0.00
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,035	25	\$15	80%	90%	\$0.00	38,351
Electric	Restaurant	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,035	25	\$15	80%	90%	\$0.00	82,942
Electric	Restaurant	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	2,127	8	\$438	75%	70%	\$0.04	0.00
Electric	Restaurant	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,766	15	\$1,445	62%	90%	\$0.11	0.00
Electric	Restaurant	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,766	15	\$1,578	62%	90%	\$0.12	0.00
Electric	Restaurant	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	893	8	\$460	45%	90%	\$0.10	0.00
Electric	Restaurant	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	893	8	\$503	45%	90%	\$0.11	0.00
Electric	Restaurant	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	757	17	\$514	75%	50%	\$0.08	0.00
Electric	Restaurant	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	736	8	\$49	25%	25%	\$0.01	396,162
Electric	Restaurant	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	736	8	\$54	25%	25%	\$0.01	413,858
Electric	Restaurant	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	2,127	8	\$438	75%	70%	\$0.04	0.00
Electric	Restaurant	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,766	15	\$1,445	62%	90%	\$0.11	0.00
Electric	Restaurant	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,766	15	\$1,578	62%	90%	\$0.12	0.00
Electric	Restaurant	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	893	8	\$460	45%	90%	\$0.10	0.00
Electric	Restaurant	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	893	8	\$503	45%	90%	\$0.11	0.00
Electric	Restaurant	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	757	17	\$514	75%	50%	\$0.08	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	415	10	\$209	0.5%	75%	\$0.09	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	415	10	\$228	0.5%	75%	\$0.09	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,959	8	\$4,159	5.0%	95%	\$0.21	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,959	8	\$4,159	5.0%	95%	\$0.21	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,138	8	\$4,159	5.0%	95%	\$0.20	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,138	8	\$4,159	5.0%	95%	\$0.20	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,969	8	\$3,119	5.0%	95%	\$0.21	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	2,969	8	\$3,119	5.0%	95%	\$0.21	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,103	8	\$3,119	5.0%	95%	\$0.20	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,103	8	\$3,119	5.0%	95%	\$0.20	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	1,866	6	\$692	25%	80%	\$0.06	2,985,173
Electric	Restaurant	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	1,866	6	\$692	25%	80%	\$0.06	3,123,946
Electric	Restaurant	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	1,145	6	\$581	25%	80%	\$0.11	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,945	13	\$12,560	50%	N/A	\$0.62	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,945	13	\$12,560	50%	N/A	\$0.62	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,950	13	\$12,583	50%	N/A	\$0.62	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,950	13	\$12,583	50%	N/A	\$0.62	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	659	13	\$202	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	659	13	\$202	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	660	13	\$203	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	660	13	\$203	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,212	13	\$680	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,212	13	\$680	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,214	13	\$682	100%	N/A	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,214	13	\$682	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,371	13	\$1,790	100%	N/A	\$0.22	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,373	13	\$1,793	100%	N/A	\$0.22	0.00
Electric	Restaurant	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,889	8	\$460	5.0%	90%	\$0.05	679,223
Electric	Restaurant	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,889	8	\$503	5.0%	90%	\$0.05	710,799
Electric	Restaurant	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	1,557	8	\$49	5.0%	25%	\$0.01	187,037
Electric	Restaurant	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	1,557	8	\$54	5.0%	25%	\$0.01	195,732
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	276	15	\$106	100%	N/A	\$0.07	0.00
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	361	15	\$460	95%	N/A	\$0.16	0.00
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	305	16	\$3,434	50%	N/A	\$1.37	0.00
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	186	10	\$-2,9113	25%	N/A	\$-0.03	42,272
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	186	10	\$-2,9113	25%	N/A	\$-0.03	42,595
Electric	Restaurant	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	83	15	\$2,170	100%	N/A	\$3.24	0.00
Electric	Restaurant	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	137	8	\$460	5.0%	90%	\$0.67	0.00
Electric	Restaurant	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	137	8	\$503	5.0%	90%	\$0.73	0.00
Electric	Restaurant	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	113	8	\$49	10%	25%	\$0.09	0.00
Electric	Restaurant	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	113	8	\$54	10%	25%	\$0.10	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	441	11	\$171	95%	65%	\$0.06	2,345,488
Electric	Restaurant	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	441	11	\$171	95%	65%	\$0.06	2,345,488
Electric	Restaurant	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	481	11	\$187	95%	65%	\$0.06	2,675,819

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	481	11	\$187	95%	65%	\$0.06	2,675,819
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	88	13	\$75	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	88	13	\$75	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	96	13	\$82	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	96	13	\$82	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	640	10	\$209	0.5%	75%	\$0.06	2,745
Electric	Restaurant	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	640	10	\$228	0.5%	75%	\$0.06	2,232
Electric	Restaurant	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,134	8	\$4,159	5.0%	95%	\$0.27	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,134	8	\$4,159	5.0%	95%	\$0.27	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,275	8	\$4,159	5.0%	95%	\$0.25	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,275	8	\$4,159	5.0%	95%	\$0.25	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,351	8	\$3,119	5.0%	95%	\$0.27	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,351	8	\$3,119	5.0%	95%	\$0.27	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,456	8	\$3,119	5.0%	95%	\$0.25	0.00
Electric	Restaurant	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,456	8	\$3,119	5.0%	95%	\$0.25	0.00
Electric	Restaurant	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	1,154	6	\$281	25%	80%	\$0.02	216,974
Electric	Restaurant	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	1,154	6	\$281	25%	80%	\$0.02	266,835
Electric	Restaurant	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	520	6	\$202	25%	80%	\$0.08	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	88	13	\$75	95%	95%	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	88	13	\$75	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	96	13	\$82	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	96	13	\$82	95%	95%	\$0.12	0.00
Electric	Restaurant	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,563	13	\$9,361	100%	N/A	\$0.52	0.00
Electric	Restaurant	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,563	13	\$9,361	100%	N/A	\$0.52	0.00
Electric	Restaurant	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	4,165	13	\$6,974	100%	N/A	\$0.24	0.00
Electric	Restaurant	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	4,165	13	\$6,974	100%	N/A	\$0.24	0.00
Electric	Restaurant	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	2,916	8	\$460	5.0%	90%	\$0.03	150,530
Electric	Restaurant	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	New	2,916	8	\$503	5.0%	90%	\$0.03	122,402
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	36,845	4	\$210	85%	N/A	\$-0.02	0.00
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	44,660	4	\$254	85%	N/A	\$-0.02	0.00
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	30,803	1	\$64	100%	N/A	\$0.01	0.00
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	37,336	1	\$78	100%	N/A	\$0.01	0.00
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	37,125	12	\$5,353	85%	N/A	\$0.00	11,571,619
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	37,125	12	\$5,353	85%	N/A	\$0.00	11,571,619
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	44,999	12	\$6,489	85%	N/A	\$0.00	13,981,908
Electric	Restaurant	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	44,999	12	\$6,489	85%	N/A	\$0.00	13,981,908
Electric	Restaurant	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	2,312	8	\$460	5.0%	90%	\$0.04	492,038
Electric	Restaurant	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	2,312	8	\$503	5.0%	90%	\$0.04	424,039
Electric	Restaurant	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	1,906	8	\$49	1.0%	25%	\$0.01	27,078

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	1,906	8	\$54	1.0%	25%	\$0.01	23,336
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	3	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	71	10	\$0.41	95%	75%	\$0.00	510,907
Electric	Restaurant	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	71	10	\$0.41	95%	75%	\$0.00	546,366
Electric	Restaurant	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	704	10	\$498	75%	85%	\$0.12	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	50	4	\$9	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	50	4	\$9	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	55	4	\$10	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	55	4	\$10	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	1	7	\$0.83	10%	90%	\$0.10	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	3	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Restaurant	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	71	10	\$0.41	95%	75%	\$0.00	57,005
Electric	Restaurant	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	71	10	\$0.41	95%	75%	\$0.00	68,487
Electric	Restaurant	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	704	10	\$498	75%	85%	\$0.12	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	50	4	\$9	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	50	4	\$9	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	55	4	\$10	60%	90%	\$0.07	0.00
Electric	Restaurant	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	55	4	\$10	60%	90%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	6	6	\$7	100%	N/A	\$0.32	0.00
Electric	Restaurant	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	6	6	\$7	100%	N/A	\$0.32	1
Electric	Restaurant	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	6	6	\$7	100%	N/A	\$0.32	2
Electric	Restaurant	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	31	6	\$4	100%	N/A	\$0.04	2,004
Electric	Restaurant	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	31	6	\$4	100%	N/A	\$0.04	3,652
Electric	Restaurant	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	31	6	\$4	100%	N/A	\$0.04	0.00
Electric	Restaurant	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	1,636	8	\$140	25%	75%	\$0.02	2,601,117
Electric	Restaurant	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	1,636	8	\$140	25%	75%	\$0.02	2,749,312
Electric	Restaurant	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	3,631	15	\$882	10%	50%	\$0.03	1,547,898
Electric	Restaurant	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	3,631	15	\$882	10%	50%	\$0.03	1,636,087
Electric	Restaurant	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	2,509	15	\$271	10%	90%	\$0.01	1,925,103
Electric	Restaurant	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	2,509	15	\$271	10%	90%	\$0.01	2,034,783
Electric	Restaurant	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	139	15	\$91	10%	90%	\$0.09	0.00
Electric	Restaurant	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	Existing	2,456	10	\$2,037	10%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	3,334	10	\$2,761	10%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	Existing	781	10	\$3,300	5.0%	70%	\$0.72	0.00
Electric	Restaurant	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	361	8	\$35	1.0%	95%	\$0.02	29,253
Electric	Restaurant	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	361	8	\$35	1.0%	95%	\$0.02	30,920
Electric	Restaurant	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	155	15	\$140	35%	80%	\$0.12	0.00
Electric	Restaurant	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	192	12	\$182	95%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	675	5	\$107	30%	90%	\$0.05	1,532,370
Electric	Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	675	5	\$107	30%	90%	\$0.05	1,619,674
Electric	Restaurant	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	Existing	3,043	3	\$477	10%	90%	\$0.07	0.00
Electric	Restaurant	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	151	12	-\$35.3515	95%	80%	-\$0.04	979,519
Electric	Restaurant	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	151	12	-\$35.3515	95%	80%	-\$0.04	1,035,326
Electric	Restaurant	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	274	4	\$198	5.0%	80%	\$0.25	0.00
Electric	Restaurant	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	274	15	\$304	35%	95%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	1,636	8	\$140	25%	20%	\$0.02	76,797

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	1,636	8	\$140	25%	20%	\$0.02	93,337
Electric	Restaurant	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	2,902	15	\$705	10%	50%	\$0.03	133,029
Electric	Restaurant	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	2,902	15	\$705	10%	50%	\$0.03	162,402
Electric	Restaurant	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	1,963	10	\$1,628	10%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	2,665	10	\$2,207	10%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	New	624	10	\$3,300	5.0%	70%	\$0.90	0.00
Electric	Restaurant	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	288	8	\$28	1.0%	95%	\$0.02	2,580
Electric	Restaurant	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	288	8	\$28	1.0%	95%	\$0.02	3,135
Electric	Restaurant	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	155	15	\$140	35%	80%	\$0.12	0.00
Electric	Restaurant	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	192	12	\$182	95%	80%	\$0.14	0.00
Electric	Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	675	5	\$107	30%	90%	\$0.05	170,244
Electric	Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	675	5	\$107	30%	90%	\$0.05	206,910
Electric	Restaurant	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	New	1,216	3	\$147	5.0%	90%	\$0.06	0.00
Electric	Restaurant	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	151	12	\$-35.3515	95%	80%	\$-0.04	108,094
Electric	Restaurant	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	151	12	\$-35.3515	95%	80%	\$-0.04	131,375
Electric	Restaurant	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	274	4	\$198	5.0%	80%	\$0.25	0.00
Electric	Restaurant	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	274	15	\$304	35%	95%	\$0.14	0.00
Electric	Restaurant	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	246	20	\$670	100%	N/A	\$0.31	0.00
Electric	Restaurant	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	276	20	\$898	100%	N/A	\$0.37	0.00
Electric	Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	216	20	\$52	100%	N/A	\$0.03	186,402
Electric	Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	216	20	\$52	100%	N/A	\$0.03	203,695
Electric	Restaurant	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	68	20	\$24	100%	N/A	\$0.04	0.00
Electric	Restaurant	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,688	20	\$178	8.8%	100%	\$0.01	979,840
Electric	Restaurant	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,688	20	\$178	8.8%	100%	\$0.01	979,840
Electric	Restaurant	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,723	20	\$172	8.8%	100%	\$0.01	1,069,213
Electric	Restaurant	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,723	20	\$172	8.8%	100%	\$0.01	1,069,213
Electric	Restaurant	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	246	20	\$670	100%	N/A	\$0.31	0.00
Electric	Restaurant	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	276	20	\$898	100%	N/A	\$0.37	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	216	20	\$52	100%	N/A	\$0.03	87,170
Electric	Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	216	20	\$52	100%	N/A	\$0.03	87,831
Electric	Restaurant	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	68	20	\$24	100%	N/A	\$0.04	0.00
Electric	Restaurant	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	152	15	\$1,455	45%	95%	\$1.25	0.00
Electric	Restaurant	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	194	15	\$1,455	45%	95%	\$0.98	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	279	15	\$19,574	2.5%	65%	\$9.15	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	356	15	\$19,574	2.5%	65%	\$7.18	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	279	15	\$16,167	2.5%	65%	\$7.55	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	356	15	\$16,167	2.5%	65%	\$5.93	0.00
Electric	Restaurant	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	68	12	\$5,449	65%	85%	\$11.91	0.00
Electric	Restaurant	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	87	12	\$5,449	65%	85%	\$9.35	0.00
Electric	Restaurant	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	152	40	\$42,133	2.0%	100%	\$24.50	0.00
Electric	Restaurant	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	194	40	\$42,133	2.0%	100%	\$19.24	0.00
Electric	Restaurant	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	76	12	\$169	10%	60%	\$0.33	0.00
Electric	Restaurant	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	97	12	\$169	10%	60%	\$0.26	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$2,190	45%	65%	\$90.11	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$2,190	45%	65%	\$70.78	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.53	25	\$1,053	25%	85%	\$202.35	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.67	25	\$1,053	25%	85%	\$158.93	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	142	9	\$49	100%	N/A	\$0.06	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	142	9	\$49	100%	N/A	\$0.06	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	181	9	\$49	100%	N/A	\$0.05	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	181	9	\$49	100%	N/A	\$0.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	192	25	\$15	15%	90%	\$0.01	0.00
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	245	25	\$15	15%	90%	\$0.01	0.00
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	175	25	\$237	15%	25%	\$0.14	0.00
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	223	25	\$237	15%	25%	\$0.11	0.00
Electric	Restaurant	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	152	15	\$1,455	45%	95%	\$1.25	0.00
Electric	Restaurant	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	194	15	\$1,455	45%	95%	\$0.98	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	279	15	\$15,659	2.5%	65%	\$7.32	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	356	15	\$15,659	2.5%	65%	\$5.75	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	279	15	\$12,934	2.5%	65%	\$6.04	0.00
Electric	Restaurant	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	356	15	\$12,934	2.5%	65%	\$4.75	0.00
Electric	Restaurant	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	68	12	\$5,449	65%	85%	\$11.91	0.00
Electric	Restaurant	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	87	12	\$5,449	65%	85%	\$9.35	0.00
Electric	Restaurant	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	152	40	\$42,133	2.0%	100%	\$24.50	0.00
Electric	Restaurant	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	194	40	\$42,133	2.0%	100%	\$19.24	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.53	25	\$1,053	75%	85%	\$202.35	0.00
Electric	Restaurant	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.67	25	\$1,053	75%	85%	\$158.93	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	142	9	\$49	100%	N/A	\$0.06	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	142	9	\$49	100%	N/A	\$0.06	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	181	9	\$49	100%	N/A	\$0.05	0.00
Electric	Restaurant	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	181	9	\$49	100%	N/A	\$0.05	0.00
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	192	25	\$15	80%	90%	\$0.01	0.00
Electric	Restaurant	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	245	25	\$15	80%	90%	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	2,505	15	\$16,174	2.5%	65%	\$0.84	0.00
Electric	Restaurant	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	181	12	\$5,449	65%	85%	\$4.51	0.00
Electric	Restaurant	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	403	12	\$169	10%	60%	\$0.06	0.00
Electric	Restaurant	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	469	25	\$2,190	45%	65%	\$0.48	0.00
Electric	Restaurant	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	100	25	\$1,053	25%	85%	\$1.07	0.00
Electric	Restaurant	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	970	25	\$3,909	15%	85%	\$0.41	0.00
Electric	Restaurant	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	180	25	\$1,206	15%	95%	\$0.68	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	489	25	\$9,611	10%	45%	\$2.00	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	489	25	\$9,611	10%	45%	\$2.00	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,283	25	\$9,611	10%	45%	\$0.76	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,283	25	\$9,611	10%	45%	\$0.76	0.00
Electric	Restaurant	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	2,505	15	\$11,091	2.5%	65%	\$0.58	0.00
Electric	Restaurant	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	181	12	\$5,449	65%	85%	\$4.51	0.00
Electric	Restaurant	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	100	25	\$1,053	75%	85%	\$1.07	0.00
Electric	Restaurant	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	180	25	\$1,206	15%	95%	\$0.68	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	489	25	\$1,004	95%	85%	\$0.21	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	489	25	\$1,004	95%	85%	\$0.21	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,283	25	\$1,004	95%	85%	\$0.08	0.00
Electric	Restaurant	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,283	25	\$1,004	95%	85%	\$0.08	0.00
Electric	Restaurant	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	11	9	\$1	100%	N/A	\$0.02	57,263
Electric	Restaurant	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	11	9	\$1	100%	N/A	\$0.02	57,274
Electric	Restaurant	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	11	9	\$1	100%	N/A	\$0.02	7,338
Electric	Restaurant	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	11	9	\$1	100%	N/A	\$0.02	8,679
Electric	Restaurant	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	148	18	\$998	45%	85%	\$0.79	0.00
Electric	Restaurant	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	892	14	\$7,153	5.0%	95%	\$1.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	267	12	\$5,449	65%	85%	\$3.06	0.00
Electric	Restaurant	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	594	12	\$169	10%	60%	\$0.04	0.00
Electric	Restaurant	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	692	25	\$2,190	45%	65%	\$0.32	0.00
Electric	Restaurant	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	148	25	\$1,053	25%	85%	\$0.72	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	178	20	\$437	45%	60%	\$0.28	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	178	20	\$478	45%	60%	\$0.30	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	107	20	\$76	45%	85%	\$0.08	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	107	20	\$83	45%	85%	\$0.09	0.00
Electric	Restaurant	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,430	25	\$3,909	15%	85%	\$0.28	0.00
Electric	Restaurant	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	266	25	\$1,206	15%	95%	\$0.46	0.00
Electric	Restaurant	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,891	25	\$9,611	10%	45%	\$0.52	0.00
Electric	Restaurant	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	743	7	\$819	90%	95%	\$0.24	0.00
Electric	Restaurant	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	195	7	\$3,077	95%	95%	\$3.50	0.00
Electric	Restaurant	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	892	14	\$7,153	5.0%	95%	\$1.09	0.00
Electric	Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	267	12	\$5,449	65%	85%	\$3.06	0.00
Electric	Restaurant	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	148	25	\$1,053	75%	85%	\$0.72	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	107	20	\$76	45%	85%	\$0.08	0.00
Electric	Restaurant	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	107	20	\$83	45%	85%	\$0.09	0.00
Electric	Restaurant	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	266	25	\$1,206	15%	95%	\$0.46	0.00
Electric	Restaurant	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	720	25	\$1,004	95%	85%	\$0.14	0.00
Electric	Restaurant	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	77	10	\$11	100%	N/A	\$0.03	209,886
Electric	Restaurant	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	77	10	\$11	100%	N/A	\$0.03	220,540
Electric	Restaurant	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	77	10	\$11	100%	N/A	\$0.03	38,298

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	77	10	\$11	100%	N/A	\$0.03	45,194
Electric	Restaurant	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	1,865	18	\$6,250	95%	25%	\$0.40	0.00
Electric	Restaurant	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	112	15	\$27	95%	90%	\$0.03	524,033
Electric	Restaurant	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	112	15	\$27	95%	90%	\$0.03	537,053
Electric	Restaurant	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	2,803	20	\$463	55%	65%	\$0.02	6,027,301
Electric	Restaurant	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	2,803	20	\$463	55%	65%	\$0.02	6,177,050
Electric	Restaurant	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	73	7	\$20	65%	25%	\$0.06	0.00
Electric	Restaurant	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	1,865	18	\$6,250	95%	25%	\$0.40	0.00
Electric	Restaurant	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	112	15	\$27	95%	90%	\$0.03	54,918
Electric	Restaurant	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	112	15	\$27	95%	90%	\$0.03	72,629
Electric	Restaurant	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	2,803	20	\$463	55%	45%	\$0.02	414,499
Electric	Restaurant	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	2,803	20	\$463	55%	45%	\$0.02	499,507
Electric	Restaurant	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	554	10	\$1,155	75%	95%	\$0.35	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$73	20%	35%	\$0.42	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,908	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,908	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,909	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,909	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	75%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	110	12	\$70	75%	75%	\$0.10	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	2,218	25	\$2,200	2.5%	95%	\$0.10	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	428	9	\$0.41	95%	75%	\$0.00	385,873
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	428	9	\$0.83	95%	75%	\$0.00	405,001
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	176	9	\$0.00	95%	50%	\$0.00	105,926
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	176	9	\$0.41	95%	50%	\$0.00	111,176
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	66	9	\$16	95%	25%	\$0.05	16,622
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	66	9	\$18	95%	25%	\$0.05	17,446
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	408	4	\$123	95%	75%	\$0.11	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	277	10	\$247	75%	75%	\$0.15	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	277	10	\$269	75%	75%	\$0.17	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,264	10	\$922	45%	95%	\$0.12	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,264	10	\$1,006	45%	95%	\$0.14	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	6,622	15	\$886	75%	N/A	\$0.02	42,247
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	6,622	15	\$886	75%	N/A	\$0.02	42,752
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	6,544	15	\$530	75%	N/A	\$0.02	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	550	10	\$1,155	75%	95%	\$0.36	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$73	20%	35%	\$0.42	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,568	12	\$1,593	75%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	2,200	25	\$1,760	2.5%	95%	\$0.08	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	425	9	\$0.41	95%	75%	\$0.00	38,833
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	425	9	\$0.83	95%	75%	\$0.00	31,126
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	175	9	\$0.00	95%	50%	\$0.00	10,660
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	175	9	\$0.41	95%	50%	\$0.00	8,544
Electric	Restaurant	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	408	4	\$123	95%	75%	\$0.11	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	275	10	\$247	75%	75%	\$0.15	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	275	10	\$269	75%	75%	\$0.17	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,254	10	\$922	45%	95%	\$0.12	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,254	10	\$1,006	45%	95%	\$0.14	0.00
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	6,622	15	\$886	75%	N/A	\$0.02	6,352
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	6,622	15	\$886	75%	N/A	\$0.02	7,842
Electric	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	6,544	15	\$530	75%	N/A	\$0.02	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	579	10	\$1,155	75%	95%	\$0.34	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$73	75%	35%	\$0.42	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,908	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,908	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,909	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,909	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	2,667	12	\$1,654	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	115	12	\$70	75%	75%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	2,318	25	\$2,200	2.5%	95%	\$0.10	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	447	9	\$0.41	95%	75%	\$0.00	601,408
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	447	9	\$0.83	95%	75%	\$0.00	631,215
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	184	9	\$0.00	95%	50%	\$0.00	165,092
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	184	9	\$0.41	95%	50%	\$0.00	173,274
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	69	9	\$16	95%	25%	\$0.04	25,906
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	69	9	\$18	95%	25%	\$0.05	27,190
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	408	4	\$123	95%	75%	\$0.11	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	289	10	\$247	75%	75%	\$0.14	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	289	10	\$269	75%	75%	\$0.16	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,321	10	\$922	25%	95%	\$0.12	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,321	10	\$1,006	25%	95%	\$0.13	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	6,124	15	\$4,552	75%	N/A	\$0.11	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	358	15	\$198	100%	N/A	\$0.07	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	562	10	\$1,155	75%	95%	\$0.35	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$73	75%	35%	\$0.42	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,801	12	\$1,593	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	2,568	12	\$1,593	85%	95%	\$0.09	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	2,248	25	\$1,760	2.5%	95%	\$0.08	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	434	9	\$0.41	95%	75%	\$0.00	76,742
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	434	9	\$0.83	95%	75%	\$0.00	61,486
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	178	9	\$0.00	95%	50%	\$0.00	21,066
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	178	9	\$0.41	95%	50%	\$0.00	16,878
Electric	Restaurant	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	408	4	\$123	95%	75%	\$0.11	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	281	10	\$247	75%	75%	\$0.15	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	281	10	\$269	75%	75%	\$0.16	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,281	10	\$922	25%	95%	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,281	10	\$1,006	25%	95%	\$0.13	0.00
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	6,124	15	\$4,552	75%	N/A	\$0.11	155
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	6,124	15	\$4,552	75%	N/A	\$0.11	352
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	358	15	\$198	100%	N/A	\$0.07	-29.17518
Electric	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	358	15	\$198	100%	N/A	\$0.07	-269.913996
Electric	School	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	3,547	4	\$405	100%	N/A	\$0.04	0.00
Electric	School	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	5,473	4	\$405	95%	65%	\$0.03	15,958,845
Electric	School	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	5,473	4	\$405	95%	65%	\$0.03	18,741,287
Electric	School	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	3,547	4	\$405	100%	N/A	\$0.04	0.00
Electric	School	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	5,473	4	\$405	95%	65%	\$0.03	2,037,170
Electric	School	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	5,473	4	\$405	95%	65%	\$0.03	2,228,769
Electric	School	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	56	12	\$33	26%	60%	\$0.09	0.00
Electric	School	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	9	12	\$25	26%	70%	\$0.41	0.00
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	32	12	\$7	26%	40%	\$0.04	3,305
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	32	12	\$7	26%	40%	\$0.04	3,305
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	32	12	\$7	26%	40%	\$0.04	14,197
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	32	12	\$7	26%	40%	\$0.04	14,197
Electric	School	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	Existing	92	12	\$59	75%	85%	\$0.10	0.00
Electric	School	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	159	12	\$87	14%	75%	\$0.08	0.00
Electric	School	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	56	12	\$33	26%	60%	\$0.09	0.00
Electric	School	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	9	12	\$25	26%	70%	\$0.41	0.00
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	32	12	\$7	26%	40%	\$0.04	441
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	32	12	\$7	26%	40%	\$0.04	441
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	32	12	\$7	26%	40%	\$0.04	1,474
Electric	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	32	12	\$7	26%	40%	\$0.04	1,474
Electric	School	Cooking	Hot Food Holding Cabinet	ENERGY STAR Hot Food Holding Cabinet	Non ENERGY STAR Hot Food Holding Cabinet	Per Building	New	92	12	\$59	75%	85%	\$0.10	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	159	12	\$87	14%	75%	\$0.08	0.00
Electric	School	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	848	15	\$1,292	25%	95%	\$0.20	0.00
Electric	School	Cooling Chillers	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	848	15	\$1,292	25%	95%	\$0.20	52,135
Electric	School	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	1,976	10	\$27,110	25%	95%	\$2.33	0.00
Electric	School	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	1,306	10	\$17,615	75%	95%	\$2.29	0.00
Electric	School	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	1,306	15	\$62,946	45%	90%	\$6.30	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	580	15	\$1,339	90%	90%	\$0.30	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	580	15	\$1,339	90%	90%	\$0.30	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	888	15	\$2,050	90%	90%	\$0.30	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	888	15	\$2,050	90%	90%	\$0.30	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	347	15	\$625	75%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	347	15	\$625	75%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	532	15	\$956	75%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	532	15	\$956	75%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	5,249	20	\$11,172	100%	N/A	\$0.24	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	1,640	20	\$1,861	100%	N/A	\$0.13	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	1,640	20	\$1,861	100%	N/A	\$0.13	10,067
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - Premium Efficiency	Premium Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	Existing	3,281	20	\$6,828	100%	N/A	\$0.23	0.00
Electric	School	Cooling Chillers	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	7,841	15	\$78,602	15%	70%	\$1.31	0.00
Electric	School	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	2,613	15	\$6,880	65%	95%	\$0.34	0.00
Electric	School	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	2,091	7	\$3,353	10%	95%	\$0.36	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	3,659	15	\$299	65%	35%	\$0.01	334,250
Electric	School	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	3,659	15	\$299	65%	35%	\$0.01	513,009
Electric	School	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	1,045	13	\$2,427	75%	75%	\$0.33	0.00
Electric	School	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	3,920	5	\$1,616	75%	75%	\$0.12	694,548
Electric	School	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	3,920	5	\$1,616	75%	75%	\$0.12	1,065,996
Electric	School	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,176	12	\$5,450	25%	85%	\$0.70	0.00
Electric	School	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	2,613	40	\$99,117	2.0%	100%	\$6.76	0.00
Electric	School	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,306	12	\$682	10%	60%	\$0.08	20,450
Electric	School	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,306	12	\$682	10%	60%	\$0.08	31,386
Electric	School	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	100	25	\$10,350	45%	65%	\$10.44	0.00
Electric	School	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	9	25	\$4,982	25%	85%	\$55.89	0.00
Electric	School	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	3,267	7	\$5,096	90%	95%	\$0.35	0.00
Electric	School	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	2,613	3	\$2	95%	20%	\$0.00	206,780
Electric	School	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	2,613	3	\$2	95%	20%	\$0.00	317,366
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	2,723	10	\$6,011	35%	70%	\$0.38	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	2,723	10	\$6,011	35%	70%	\$0.38	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	4,975	10	\$6,011	35%	70%	\$0.21	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	4,975	10	\$6,011	35%	70%	\$0.21	0.00
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	3,297	25	\$62	15%	90%	\$0.00	155,110
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	3,297	25	\$62	15%	90%	\$0.00	238,063
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,008	25	\$954	15%	25%	\$0.03	29,545
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,008	25	\$954	15%	25%	\$0.03	45,346
Electric	School	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	1,677	10	\$24,402	25%	95%	\$2.47	0.00
Electric	School	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	1,109	10	\$17,615	0.0%	0%	\$2.70	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	347	15	\$625	95%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	347	15	\$625	95%	90%	\$0.24	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	532	15	\$956	95%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	532	15	\$956	95%	90%	\$0.24	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.52 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	5,249	20	\$10,057	100%	N/A	\$0.21	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	1,640	20	\$1,675	100%	N/A	\$0.11	0.00
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - High Efficiency	High Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	1,640	20	\$1,675	100%	N/A	\$0.11	7,870
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - Premium Efficiency	Premium Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	3,281	20	\$6,145	100%	N/A	\$0.21	1,864
Electric	School	Cooling Chillers	Chillers 150-300 tons (screw) - Premium Efficiency	Premium Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.68 kW/ton (full load)	Per Building	New	3,281	20	\$6,145	100%	N/A	\$0.21	1,900
Electric	School	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	727	7	\$19,133	95%	95%	\$5.83	0.00
Electric	School	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	2,218	15	\$6,880	65%	95%	\$0.41	0.00
Electric	School	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	1,774	7	\$3,014	10%	95%	\$0.38	0.00
Electric	School	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	3,327	5	\$1,616	25%	25%	\$0.14	0.00
Electric	School	Cooling Chillers	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	3,327	5	\$1,616	25%	25%	\$0.14	7,694
Electric	School	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	998	12	\$5,450	25%	85%	\$0.82	0.00
Electric	School	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	2,218	40	\$99,117	2.0%	100%	\$7.97	0.00
Electric	School	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	7	25	\$4,982	75%	85%	\$65.84	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	2,723	10	\$6,011	0.0%	0%	\$0.38	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	2,723	10	\$6,011	0.0%	0%	\$0.38	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	4,975	10	\$6,011	0.0%	0%	\$0.21	0.00
Electric	School	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	4,975	10	\$6,011	0.0%	0%	\$0.21	0.00
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,799	25	\$62	80%	90%	\$0.00	81,648
Electric	School	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	2,799	25	\$62	80%	90%	\$0.00	144,983
Electric	School	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,048	15	\$1,292	25%	95%	\$0.16	0.00
Electric	School	Cooling Dx Evap	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,105	15	\$1,292	25%	95%	\$0.15	382,345

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	9,694	15	\$78,602	15%	70%	\$1.06	0.00
Electric	School	Cooling Dx Evap	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	10,222	15	\$78,602	15%	70%	\$1.01	0.00
Electric	School	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,231	15	\$6,880	65%	95%	\$0.28	0.00
Electric	School	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	3,407	15	\$6,880	65%	95%	\$0.26	0.00
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	1,556	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	2,982	15	\$2,743	100%	N/A	\$0.12	534,778
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	2,982	15	\$2,743	100%	N/A	\$0.12	786,214
Electric	School	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	4,847	10	\$19,547	10%	60%	\$0.69	0.00
Electric	School	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	5,111	10	\$19,547	10%	60%	\$0.65	0.00
Electric	School	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	4,847	5	\$1,616	75%	75%	\$0.10	9,158,193
Electric	School	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	5,111	5	\$1,616	75%	75%	\$0.09	5,093,577
Electric	School	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	807	18	\$6,205	45%	85%	\$0.91	0.00
Electric	School	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	851	18	\$6,205	45%	85%	\$0.86	0.00
Electric	School	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	20,044	15	\$-58949.094	35%	N/A	\$-0.51	6,956,125
Electric	School	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	Existing	20,044	15	\$-58949.094	35%	N/A	\$-0.51	13,527,598
Electric	School	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,454	12	\$5,450	25%	85%	\$0.56	0.00
Electric	School	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,533	12	\$5,450	25%	85%	\$0.53	0.00
Electric	School	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,231	40	\$99,117	2.0%	100%	\$5.47	0.00
Electric	School	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	3,407	40	\$99,117	2.0%	100%	\$5.19	0.00
Electric	School	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,615	12	\$682	10%	60%	\$0.06	269,650
Electric	School	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,703	12	\$682	10%	60%	\$0.06	149,973
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	124	25	\$10,350	45%	65%	\$8.45	0.00
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	131	25	\$10,350	45%	65%	\$8.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	11	25	\$4,982	25%	85%	\$45.20	0.00
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	11	25	\$4,982	25%	85%	\$42.87	0.00
Electric	School	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	969	20	\$3,392	45%	60%	\$0.39	0.00
Electric	School	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,022	20	\$5,191	45%	60%	\$0.57	0.00
Electric	School	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	581	20	\$592	45%	85%	\$0.11	564,953
Electric	School	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	613	20	\$910	45%	85%	\$0.17	0.00
Electric	School	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,039	7	\$5,096	90%	95%	\$0.28	0.00
Electric	School	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	4,259	7	\$5,096	90%	95%	\$0.27	0.00
Electric	School	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	3,231	5	\$5,517	95%	50%	\$0.50	0.00
Electric	School	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	3,407	5	\$5,517	95%	50%	\$0.47	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	2,723	10	\$6,011	35%	70%	\$0.38	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	2,723	10	\$6,011	35%	70%	\$0.38	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	4,975	10	\$6,011	35%	70%	\$0.21	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	4,975	10	\$6,011	35%	70%	\$0.21	0.00
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,077	25	\$62	15%	90%	\$0.00	1,980,113
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	4,299	25	\$62	15%	90%	\$0.00	1,101,293
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,719	25	\$954	15%	25%	\$0.03	389,583
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	3,921	25	\$954	15%	25%	\$0.02	216,677
Electric	School	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	989	7	\$19,133	95%	95%	\$4.29	0.00
Electric	School	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,039	7	\$19,133	95%	95%	\$4.08	0.00
Electric	School	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,016	15	\$6,880	65%	95%	\$0.30	0.00
Electric	School	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	3,169	15	\$6,880	65%	95%	\$0.28	0.00
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.0 EER	Per Building	New	1,556	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	2,982	15	\$2,195	100%	N/A	\$0.10	165,865
Electric	School	Cooling Dx Evap	DX Package 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	2,982	15	\$2,195	100%	N/A	\$0.10	286,518
Electric	School	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	4,525	5	\$1,616	25%	25%	\$0.10	117,951
Electric	School	Cooling Dx Evap	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	4,754	5	\$1,616	25%	25%	\$0.10	51,069

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	20,044	15	\$-44040.525	35%	N/A	\$-0.39	1,433,496
Electric	School	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.0 EER	Per Building	New	20,044	15	\$-44040.525	35%	N/A	\$-0.39	3,196,993
Electric	School	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,357	12	\$5,450	25%	85%	\$0.60	0.00
Electric	School	Cooling Dx Evap	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,426	12	\$5,450	25%	85%	\$0.57	0.00
Electric	School	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,016	40	\$99,117	2.0%	100%	\$5.86	0.00
Electric	School	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	3,169	40	\$99,117	2.0%	100%	\$5.58	0.00
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	10	25	\$4,982	75%	85%	\$48.42	0.00
Electric	School	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	11	25	\$4,982	75%	85%	\$46.08	0.00
Electric	School	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	543	20	\$592	45%	85%	\$0.12	61,740
Electric	School	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	570	20	\$910	45%	85%	\$0.18	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	2,723	10	\$6,011	0.0%	0%	\$0.38	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	2,723	10	\$6,011	0.0%	0%	\$0.38	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	4,975	10	\$6,011	0.0%	0%	\$0.21	0.00
Electric	School	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	4,975	10	\$6,011	0.0%	0%	\$0.21	0.00
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	3,806	25	\$62	80%	90%	\$0.00	1,144,957
Electric	School	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	3,999	25	\$62	80%	90%	\$0.00	541,897
Electric	School	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	60	6	\$0.00	100%	N/A	\$0.00	291,437
Electric	School	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	60	6	\$0.00	100%	N/A	\$0.00	321,974
Electric	School	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	60	6	\$0.00	100%	N/A	\$0.00	48,044
Electric	School	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	60	6	\$0.00	100%	N/A	\$0.00	51,856
Electric	School	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	479	4	\$540	100%	N/A	\$0.40	0.00
Electric	School	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	479	4	\$540	100%	N/A	\$0.40	70
Electric	School	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	479	4	\$540	100%	N/A	\$0.40	90
Electric	School	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	16	20	\$2	100%	N/A	\$0.02	0.00
Electric	School	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	45	20	\$0.00	100%	N/A	\$0.00	79,862
Electric	School	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	45	20	\$0.00	100%	N/A	\$0.00	-1340.2581
Electric	School	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	312	20	\$43	8.8%	100%	\$0.02	173,882

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	312	20	\$43	8.8%	100%	\$0.02	173,882
Electric	School	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	369	20	\$43	8.8%	100%	\$0.01	174,802
Electric	School	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	369	20	\$43	8.8%	100%	\$0.01	174,802
Electric	School	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	16	20	\$2	100%	N/A	\$0.02	0.00
Electric	School	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	45	20	\$0.00	100%	N/A	\$0.00	27,711
Electric	School	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	45	20	\$0.00	100%	N/A	\$0.00	-174.02616
Electric	School	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.0 EER, 3.3 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	1,435	15	\$97,646	100%	N/A	\$63.54	0.00
Electric	School	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	3,071	15	\$11,211	100%	N/A	\$0.48	0.00
Electric	School	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,531	15	\$1,292	25%	95%	\$0.11	0.00
Electric	School	Heat Pump	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	1,531	15	\$1,292	25%	95%	\$0.11	388,780
Electric	School	Heat Pump	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	12,682	15	\$78,602	15%	70%	\$0.81	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	883	15	\$6,880	65%	95%	\$1.02	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	883	15	\$6,880	65%	95%	\$1.02	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,665	15	\$6,880	65%	95%	\$0.54	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,665	15	\$6,880	65%	95%	\$0.54	0.00
Electric	School	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	6,341	5	\$1,616	75%	75%	\$0.07	0.00
Electric	School	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	6,341	5	\$1,616	75%	75%	\$0.07	4,639,013
Electric	School	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	1,056	18	\$6,205	45%	85%	\$0.69	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,843	14	\$23,451	5.0%	95%	\$0.83	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	3,843	14	\$23,451	5.0%	95%	\$0.83	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	5,016	14	\$23,451	5.0%	95%	\$0.64	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	5,016	14	\$23,451	5.0%	95%	\$0.64	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,902	12	\$5,450	25%	85%	\$0.43	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	883	40	\$99,117	2.0%	100%	\$20.00	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	883	40	\$99,117	2.0%	100%	\$20.00	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,665	40	\$99,117	2.0%	100%	\$10.61	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,665	40	\$99,117	2.0%	100%	\$10.61	0.00
Electric	School	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	Existing	13,400	30	\$94,492	5.0%	N/A	\$4.84	0.00
Electric	School	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,170	12	\$682	10%	60%	\$0.03	0.00
Electric	School	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	3,170	12	\$682	10%	60%	\$0.03	205,192
Electric	School	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	5,045	25	\$10,350	45%	65%	\$0.21	1,438,344
Electric	School	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	5,045	25	\$10,350	45%	65%	\$0.21	1,438,344
Electric	School	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,534	25	\$10,350	45%	65%	\$0.16	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,534	25	\$10,350	45%	65%	\$0.16	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	640	25	\$4,982	25%	85%	\$0.79	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	640	25	\$4,982	25%	85%	\$0.79	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	831	25	\$4,982	25%	85%	\$0.61	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	831	25	\$4,982	25%	85%	\$0.61	0.00
Electric	School	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,268	20	\$3,392	45%	60%	\$0.30	0.00
Electric	School	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,268	20	\$5,191	45%	60%	\$0.46	0.00
Electric	School	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	760	20	\$592	45%	85%	\$0.09	0.00
Electric	School	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	760	20	\$910	45%	85%	\$0.13	273,808
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,832	25	\$18,476	15%	85%	\$0.28	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	6,832	25	\$18,476	15%	85%	\$0.28	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9,442	25	\$18,476	15%	85%	\$0.20	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9,442	25	\$18,476	15%	85%	\$0.20	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,331	25	\$5,701	15%	95%	\$0.44	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,331	25	\$5,701	15%	95%	\$0.44	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,836	25	\$5,701	15%	95%	\$0.32	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	1,836	25	\$5,701	15%	95%	\$0.32	0.00
Electric	School	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	6,742	25	\$45,423	10%	45%	\$0.69	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	5,284	7	\$5,096	90%	95%	\$0.21	0.00
Electric	School	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	4,227	3	\$5,517	95%	50%	\$0.60	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	569	10	\$6,011	35%	70%	\$1.79	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	569	10	\$6,011	35%	70%	\$1.79	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,960	10	\$6,011	35%	70%	\$0.52	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,960	10	\$6,011	35%	70%	\$0.52	0.00
Electric	School	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	559	25	\$954	15%	25%	\$0.17	0.00
Electric	School	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - High Efficiency	High Efficiency - 11.0 EER, 3.3 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	1,435	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	School	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	3,071	15	\$8,972	100%	N/A	\$0.38	159
Electric	School	Heat Pump	Air Source Heat Pump 135 to 240 kBtuh - Premium Efficiency	Premium Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	3,071	15	\$8,972	100%	N/A	\$0.38	0.00
Electric	School	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,306	7	\$19,133	95%	95%	\$3.25	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	832	15	\$6,880	65%	95%	\$1.08	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	832	15	\$6,880	65%	95%	\$1.08	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,569	15	\$6,880	65%	95%	\$0.57	0.00
Electric	School	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,569	15	\$6,880	65%	95%	\$0.57	0.00
Electric	School	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	5,976	5	\$1,616	25%	25%	\$0.08	0.00
Electric	School	Heat Pump	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	5,976	5	\$1,616	25%	25%	\$0.08	52,500
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,621	14	\$23,451	5.0%	95%	\$0.88	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	3,621	14	\$23,451	5.0%	95%	\$0.88	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	4,727	14	\$23,451	5.0%	95%	\$0.68	0.00
Electric	School	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	4,727	14	\$23,451	5.0%	95%	\$0.68	0.00
Electric	School	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,792	12	\$5,450	25%	85%	\$0.46	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	832	40	\$99,117	2.0%	100%	\$21.23	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	832	40	\$99,117	2.0%	100%	\$21.23	0.00
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,569	40	\$99,117	2.0%	100%	\$11.26	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,569	40	\$99,117	2.0%	100%	\$11.26	0.00
Electric	School	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 135 to 240 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER 4.0 COP	Standard Efficiency - 10.6 EER, 3.2 COP	Per Building	New	13,400	30	\$57,179	5.0%	N/A	\$2.46	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	603	25	\$4,982	75%	85%	\$0.84	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	603	25	\$4,982	75%	85%	\$0.84	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	783	25	\$4,982	75%	85%	\$0.65	0.00
Electric	School	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	783	25	\$4,982	75%	85%	\$0.65	0.00
Electric	School	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	717	20	\$592	45%	85%	\$0.09	0.00
Electric	School	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	717	20	\$910	45%	85%	\$0.14	29,682
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,254	25	\$5,701	15%	95%	\$0.46	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,254	25	\$5,701	15%	95%	\$0.46	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,730	25	\$5,701	15%	95%	\$0.34	0.00
Electric	School	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	1,730	25	\$5,701	15%	95%	\$0.34	0.00
Electric	School	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	587	25	\$4,749	95%	85%	\$0.82	0.00
Electric	School	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	587	25	\$4,749	95%	85%	\$0.82	51,973
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	New	569	10	\$6,011	0.0%	0%	\$1.79	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	New	569	10	\$6,011	0.0%	0%	\$1.79	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,960	10	\$6,011	0.0%	0%	\$0.52	0.00
Electric	School	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,960	10	\$6,011	0.0%	0%	\$0.52	0.00
Electric	School	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	4,258	8	\$954	75%	70%	\$0.04	0.00
Electric	School	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	3,537	15	\$3,601	62%	90%	\$0.13	0.00
Electric	School	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	3,537	15	\$5,515	62%	90%	\$0.20	0.00
Electric	School	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,237	8	\$3,562	90%	75%	\$0.58	0.00
Electric	School	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,237	8	\$5,460	90%	75%	\$0.88	0.00
Electric	School	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	Existing	2,421	8	\$674	5.0%	50%	\$0.06	0.00
Electric	School	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	4,710	17	\$3,200	75%	50%	\$0.08	0.00
Electric	School	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,473	8	\$310	25%	25%	\$0.04	0.00
Electric	School	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	1,473	8	\$475	25%	25%	\$0.06	0.00
Electric	School	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	4,258	8	\$954	75%	70%	\$0.04	0.00
Electric	School	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	3,537	15	\$3,601	62%	90%	\$0.13	0.00
Electric	School	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	3,537	15	\$5,515	62%	90%	\$0.20	0.00
Electric	School	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,237	8	\$3,562	90%	75%	\$0.58	0.00
Electric	School	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,237	8	\$5,460	90%	75%	\$0.88	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Lighting Exterior	Parking - Covered Lighting	Covered Parking Lighting	Normal Lighting	Per Building	New	2,421	8	\$674	5.0%	50%	\$0.06	0.00
Electric	School	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	4,710	17	\$3,200	75%	50%	\$0.08	0.00
Electric	School	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	1,718	10	\$1,621	10%	75%	\$0.16	0.00
Electric	School	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	1,718	10	\$2,482	10%	75%	\$0.25	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,682	8	\$11,216	30%	80%	\$0.48	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,682	8	\$11,216	30%	80%	\$0.48	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,139	8	\$11,216	30%	80%	\$0.31	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,139	8	\$11,216	30%	80%	\$0.31	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,511	8	\$8,410	30%	80%	\$0.48	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	3,511	8	\$8,410	30%	80%	\$0.48	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,354	8	\$8,410	30%	80%	\$0.31	0.00
Electric	School	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,354	8	\$8,410	30%	80%	\$0.31	0.00
Electric	School	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	241	6	\$90	10%	80%	\$0.06	0.00
Electric	School	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	147	6	\$74	10%	80%	\$0.11	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	13,092	13	\$86,956	50%	N/A	\$0.96	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	13,092	13	\$86,956	50%	N/A	\$0.96	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	13,108	13	\$87,062	50%	N/A	\$0.96	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	13,108	13	\$87,062	50%	N/A	\$0.96	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,931	13	\$2,006	100%	N/A	\$0.12	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,931	13	\$2,006	100%	N/A	\$0.12	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,935	13	\$2,009	100%	N/A	\$0.12	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,935	13	\$2,009	100%	N/A	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	5,387	13	\$4,982	100%	N/A	\$0.14	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	5,387	13	\$4,982	100%	N/A	\$0.14	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	5,394	13	\$4,987	100%	N/A	\$0.14	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	5,394	13	\$4,987	100%	N/A	\$0.14	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	6,094	13	\$14,039	100%	N/A	\$0.38	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	6,094	13	\$14,039	100%	N/A	\$0.38	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	6,102	13	\$14,055	100%	N/A	\$0.38	0.00
Electric	School	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	6,102	13	\$14,055	100%	N/A	\$0.38	0.00
Electric	School	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	5,412	8	\$3,562	75%	75%	\$0.13	0.00
Electric	School	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	5,412	8	\$5,460	75%	75%	\$0.20	0.00
Electric	School	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	6,443	8	\$310	5.0%	25%	\$0.01	445,924
Electric	School	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	6,443	8	\$475	5.0%	25%	\$0.01	512,155
Electric	School	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,591	15	\$1,285	100%	N/A	\$0.12	0.00
Electric	School	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,078	15	\$5,109	95%	N/A	\$0.32	0.00
Electric	School	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,760	29	\$37,214	50%	N/A	\$2.00	0.00
Electric	School	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,071	19	\$103	25%	N/A	\$-0.02	280,149

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,071	19	\$103	25%	N/A	\$-0.02	309,998
Electric	School	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	482	15	\$23,559	100%	N/A	\$6.24	0.00
Electric	School	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	574	8	\$3,562	75%	75%	\$1.24	0.00
Electric	School	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	574	8	\$5,460	75%	75%	\$1.90	0.00
Electric	School	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	684	8	\$310	10%	25%	\$0.09	0.00
Electric	School	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	684	8	\$475	10%	25%	\$0.14	0.00
Electric	School	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	172	11	\$67	95%	65%	\$0.06	0.00
Electric	School	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	172	11	\$67	95%	65%	\$0.06	0.00
Electric	School	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	263	11	\$103	95%	65%	\$0.06	0.00
Electric	School	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	263	11	\$103	95%	65%	\$0.06	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	34	13	\$28	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	34	13	\$28	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	52	13	\$43	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	52	13	\$43	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	1,593	10	\$1,621	10%	75%	\$0.17	0.00
Electric	School	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	1,593	10	\$2,482	10%	75%	\$0.26	0.00
Electric	School	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,760	8	\$11,216	30%	80%	\$0.60	0.00
Electric	School	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,760	8	\$11,216	30%	80%	\$0.60	0.00
Electric	School	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,733	8	\$11,216	30%	80%	\$0.39	0.00
Electric	School	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,733	8	\$11,216	30%	80%	\$0.39	0.00
Electric	School	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,820	8	\$8,410	30%	80%	\$0.60	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	2,820	8	\$8,410	30%	80%	\$0.60	0.00
Electric	School	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,300	8	\$8,410	30%	80%	\$0.39	0.00
Electric	School	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,300	8	\$8,410	30%	80%	\$0.39	0.00
Electric	School	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	121	6	\$28	10%	80%	\$0.02	6,727
Electric	School	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	121	6	\$28	10%	80%	\$0.02	7,534
Electric	School	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	54	6	\$20	10%	80%	\$0.09	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	34	13	\$28	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	34	13	\$28	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	52	13	\$43	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	52	13	\$43	95%	95%	\$0.12	0.00
Electric	School	Lighting Interior Other	Lighting Package - High Efficiency	8% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	6,374	13	\$10,606	100%	N/A	\$0.24	0.00
Electric	School	Lighting Interior Other	Lighting Package - High Efficiency	8% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	6,374	13	\$16,625	100%	N/A	\$0.37	0.00
Electric	School	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	5,019	8	\$3,562	75%	75%	\$0.14	0.00
Electric	School	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	5,019	8	\$5,460	75%	75%	\$0.22	0.00
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,029	4	\$33	85%	N/A	\$-0.02	0.00
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,843	4	\$51	85%	N/A	\$-0.02	0.00
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,532	1	\$10	100%	N/A	\$0.01	0.00
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,048	1	\$15	100%	N/A	\$0.01	0.00
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,052	12	\$827	85%	N/A	\$0.02	1,761,481

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,879	12	\$1,318	85%	N/A	\$0.02	2,546,207
Electric	School	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	245	8	\$3,562	75%	75%	\$2.90	0.00
Electric	School	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	245	8	\$5,460	75%	75%	\$4.45	0.00
Electric	School	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	292	8	\$310	1.0%	25%	\$0.21	0.00
Electric	School	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	292	8	\$475	1.0%	25%	\$0.33	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	93	4	\$0.00	75%	45%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	26	10	\$0.00	95%	75%	\$0.00	129,026
Electric	School	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	26	10	\$0.00	95%	75%	\$0.00	151,523
Electric	School	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	Existing	621	10	\$439	75%	85%	\$0.12	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	649	4	\$129	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	649	4	\$129	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	994	4	\$199	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	994	4	\$199	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$0.00	10%	90%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	93	4	\$0.00	75%	45%	\$0.00	0.00
Electric	School	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	26	10	\$0.00	95%	75%	\$0.00	15,809

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	26	10	\$0.00	95%	75%	\$0.00	17,296
Electric	School	Other Plug Load	Ice Maker	High-Efficiency ENERGY STAR Ice Maker - Air Cooled	Standard Ice Maker	Per Building	New	621	10	\$439	75%	85%	\$0.12	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	649	4	\$129	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	649	4	\$129	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	994	4	\$199	60%	90%	\$0.07	0.00
Electric	School	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	994	4	\$199	60%	90%	\$0.07	0.00
Electric	School	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	164	6	\$204	100%	N/A	\$0.31	0.00
Electric	School	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	164	6	\$204	100%	N/A	\$0.31	32
Electric	School	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	164	6	\$204	100%	N/A	\$0.31	45
Electric	School	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$149	100%	N/A	\$0.01	82,988
Electric	School	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	Existing	3,498	10	\$149	100%	N/A	\$0.01	90,427
Electric	School	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$499	75%	N/A	\$0.01	831,270
Electric	School	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	Existing	9,933	10	\$499	75%	N/A	\$0.01	916,343
Electric	School	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$149	75%	25%	\$0.00	222,927
Electric	School	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Building	Existing	7,757	10	\$149	75%	25%	\$0.00	261,797
Electric	School	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$149	100%	N/A	\$0.01	16,978
Electric	School	Pool Pump	Pool Pump - Two Speed	Pool Pump - Two Speed	Pool Pump - Constant Speed	Per Building	New	3,498	10	\$149	100%	N/A	\$0.01	18,315
Electric	School	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$499	75%	N/A	\$0.01	165,026
Electric	School	Pool Pump	Pool Pump - VSD	Pool Pump - VSD	Pool Pump - Constant Speed	Per Building	New	9,933	10	\$499	75%	N/A	\$0.01	178,182
Electric	School	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	453	6	\$67	100%	N/A	\$0.04	21,472
Electric	School	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	453	6	\$67	100%	N/A	\$0.04	35,637
Electric	School	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	453	6	\$67	100%	N/A	\$0.04	0.00
Electric	School	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	469	8	\$38	15%	75%	\$0.02	301,667
Electric	School	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	Existing	469	8	\$38	15%	75%	\$0.02	350,147
Electric	School	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	469	15	\$113	5.0%	50%	\$0.03	67,192
Electric	School	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	Existing	469	15	\$113	5.0%	50%	\$0.03	77,990
Electric	School	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	324	15	\$36	5.0%	90%	\$0.01	83,566
Electric	School	Refrigeration	Case Replacement Low Temp	Case Replacement Low Temp	No replacement	Per Building	Existing	324	15	\$36	5.0%	90%	\$0.01	96,996
Electric	School	Refrigeration	Case Replacement Med Temp	Case Replacement Med Temp	No replacement	Per Building	Existing	40	15	\$25	5.0%	90%	\$0.08	0.00
Electric	School	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	Existing	317	10	\$263	25%	80%	\$0.14	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	Existing	430	10	\$356	25%	80%	\$0.14	0.00
Electric	School	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	Existing	100	10	\$3,301	5.0%	70%	\$5.56	0.00
Electric	School	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	46	8	\$5	1.0%	95%	\$0.02	2,539
Electric	School	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	Existing	46	8	\$5	1.0%	95%	\$0.02	2,947
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	Existing	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	Existing	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	193	5	\$31	30%	90%	\$0.05	296,147
Electric	School	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	193	5	\$31	30%	90%	\$0.05	343,739
Electric	School	Refrigeration	Refrigeration Commissioning or Re-commissioning	Commissioning / Re-commissioning	No Commissioning / Re-commissioning	Per Building	Existing	393	3	\$62	10%	90%	\$0.07	0.00
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	6	12	\$-2.5856	95%	80%	\$-0.06	30,362
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	6	12	\$-2.5856	95%	80%	\$-0.06	30,362
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	6	12	\$-2.5856	95%	80%	\$-0.06	35,241
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	Existing	6	12	\$-2.5856	95%	80%	\$-0.06	35,241
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	Existing	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	78	15	\$87	10%	95%	\$0.15	0.00
Electric	School	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	469	8	\$38	15%	20%	\$0.02	9,763
Electric	School	Refrigeration	Anti-Sweat (Humidistat) Controls	Anti-Sweat (Humidistat) Controls	No Anti-Sweat (Humidistat) Controls	Per Building	New	469	8	\$38	15%	20%	\$0.02	10,805
Electric	School	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	304	15	\$74	5.0%	50%	\$0.03	5,155
Electric	School	Refrigeration	Case Electronically Commutated Motor	ECM Case Fans	Standard Efficiency Motor	Per Building	New	304	15	\$74	5.0%	50%	\$0.03	5,731

Table F.2. Commercial Electric Measure Details

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Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Refrigeration	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Commercial Refrigerator - Semivertical - No Doors - Med Temp	Standard Case	Per Building	New	206	10	\$170	25%	80%	\$0.14	0.00
Electric	School	Refrigeration	Commercial Refrigerator - Vertical - No Doors - Med Temp	Commercial Refrigerator - Vertical - No Doors - Med Temp	Standard Case	Per Building	New	279	10	\$232	25%	80%	\$0.14	0.00
Electric	School	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	Defrost - Electric	Per Building	New	65	10	\$3,301	5.0%	70%	\$8.55	0.00
Electric	School	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	30	8	\$2	1.0%	95%	\$0.02	199
Electric	School	Refrigeration	Display Case Motion Sensors	Display Case Motion Sensors	No Motion Sensors	Per Building	New	30	8	\$2	1.0%	95%	\$0.02	221
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Evaporator Fan Controller	ECM Evaporator Fan Controller	No Controller	Per Building	New	7	15	\$7	35%	80%	\$0.14	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Glass Door ENERGY STAR Refrigerators/Freezers	Glass Door ENERGY STAR Refrigerators/Freezers	Standard Glass Doors	Per Building	New	8	12	\$7	95%	80%	\$0.13	0.00
Electric	School	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	193	5	\$31	30%	90%	\$0.05	36,088
Electric	School	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	193	5	\$31	30%	90%	\$0.05	39,940
Electric	School	Refrigeration	Refrigeration Commissioning or Re-commissioning	Refrigeration Commissioning or Re-commissioning	No Commissioning / Re-commissioning	Per Building	New	127	3	\$15	5.0%	90%	\$0.06	0.00
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	6	12	\$-2.5856	95%	80%	\$-0.06	4,072
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	6	12	\$-2.5856	95%	80%	\$-0.06	4,072
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	6	12	\$-2.5856	95%	80%	\$-0.06	3,679
Electric	School	Refrigeration	Solid Door ENERGY STAR Refrigerators/Freezers	Solid Door ENERGY STAR Refrigerators/Freezers	Standard Solid Door	Per Building	New	6	12	\$-2.5856	95%	80%	\$-0.06	3,679
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-In	Per Building	New	12	4	\$7	95%	80%	\$0.22	0.00
Electric	School	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	78	15	\$87	10%	95%	\$0.15	0.00
Electric	School	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	560	20	\$1,522	100%	N/A	\$0.31	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	628	20	\$2,042	100%	N/A	\$0.36	0.00
Electric	School	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	492	20	\$118	100%	N/A	\$0.03	311,263
Electric	School	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	492	20	\$118	100%	N/A	\$0.03	312,792
Electric	School	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	156	20	\$54	100%	N/A	\$0.04	0.00
Electric	School	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	3,840	20	\$405	8.8%	100%	\$0.01	1,497,276
Electric	School	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	3,840	20	\$405	8.8%	100%	\$0.01	1,497,276
Electric	School	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	3,918	20	\$393	8.8%	100%	\$0.01	1,794,192
Electric	School	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	3,918	20	\$393	8.8%	100%	\$0.01	1,794,192
Electric	School	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	560	20	\$1,522	100%	N/A	\$0.31	0.00
Electric	School	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	628	20	\$2,042	100%	N/A	\$0.36	0.00
Electric	School	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	492	20	\$118	100%	N/A	\$0.03	133,204
Electric	School	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	492	20	\$118	100%	N/A	\$0.03	147,386
Electric	School	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	156	20	\$54	100%	N/A	\$0.04	0.00
Electric	School	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	78	15	\$6,880	65%	95%	\$11.48	0.00
Electric	School	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	99	15	\$6,880	65%	95%	\$9.01	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	143	15	\$81,120	2.5%	65%	\$73.80	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	182	15	\$81,120	2.5%	65%	\$57.96	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	143	15	\$67,000	2.5%	65%	\$60.95	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	182	15	\$67,000	2.5%	65%	\$47.87	0.00
Electric	School	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	35	12	\$5,450	25%	85%	\$23.19	0.00
Electric	School	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	44	12	\$5,450	25%	85%	\$18.22	0.00
Electric	School	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	78	40	\$99,117	2.0%	100%	\$225.43	0.00
Electric	School	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	99	40	\$99,117	2.0%	100%	\$177.06	0.00
Electric	School	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	39	12	\$682	10%	60%	\$2.61	1,902

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	49	12	\$682	10%	60%	\$2.05	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$10,350	45%	65%	\$348.15	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$10,350	45%	65%	\$273.45	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.27	25	\$4,982	25%	85%	\$1,863.26	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.34	25	\$4,982	25%	85%	\$1,463.46	0.00
Electric	School	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	73	9	\$49	100%	N/A	\$0.12	6,904
Electric	School	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	93	9	\$49	100%	N/A	\$0.10	15,373
Electric	School	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	98	25	\$62	15%	90%	\$0.06	10,770
Electric	School	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	125	25	\$62	15%	90%	\$0.05	8,285
Electric	School	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	90	25	\$954	15%	25%	\$1.08	0.00
Electric	School	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	114	25	\$954	15%	25%	\$0.85	0.00
Electric	School	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	78	15	\$6,880	65%	95%	\$11.48	0.00
Electric	School	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	99	15	\$6,880	65%	95%	\$9.01	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	143	15	\$64,898	2.5%	65%	\$59.04	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	182	15	\$64,898	2.5%	65%	\$46.37	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	143	15	\$53,602	2.5%	65%	\$48.76	0.00
Electric	School	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	182	15	\$53,602	2.5%	65%	\$38.30	0.00
Electric	School	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	35	12	\$5,450	25%	85%	\$23.19	0.00
Electric	School	Room Cool	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	44	12	\$5,450	25%	85%	\$18.22	0.00
Electric	School	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	78	40	\$99,117	2.0%	100%	\$225.43	0.00
Electric	School	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	99	40	\$99,117	2.0%	100%	\$177.06	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.27	25	\$4,982	75%	85%	\$1,863.26	0.00
Electric	School	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.34	25	\$4,982	75%	85%	\$1,463.46	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	73	9	\$49	100%	N/A	\$0.12	2,358
Electric	School	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	93	9	\$49	100%	N/A	\$0.10	3,532
Electric	School	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	98	25	\$62	80%	90%	\$0.06	5,726
Electric	School	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	125	25	\$62	80%	90%	\$0.05	5,135
Electric	School	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	2,052	15	\$67,031	2.5%	65%	\$4.27	0.00
Electric	School	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	148	12	\$5,450	25%	85%	\$5.50	0.00
Electric	School	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	330	12	\$682	10%	60%	\$0.31	0.00
Electric	School	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	650	25	\$10,350	45%	65%	\$1.62	0.00
Electric	School	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	82	25	\$4,982	25%	85%	\$6.16	0.00
Electric	School	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	794	25	\$18,476	15%	85%	\$2.37	0.00
Electric	School	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	147	25	\$5,701	15%	95%	\$3.92	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	400	25	\$45,423	10%	45%	\$11.55	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	400	25	\$45,423	10%	45%	\$11.55	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,051	25	\$45,423	10%	45%	\$4.40	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,051	25	\$45,423	10%	45%	\$4.40	0.00
Electric	School	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	2,052	15	\$45,966	2.5%	65%	\$2.93	0.00
Electric	School	Room Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	148	12	\$5,450	25%	85%	\$5.50	0.00
Electric	School	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	82	25	\$4,982	75%	85%	\$6.16	0.00
Electric	School	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	147	25	\$5,701	15%	95%	\$3.92	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	400	25	\$4,749	95%	85%	\$1.21	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	400	25	\$4,749	95%	85%	\$1.21	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,051	25	\$4,749	95%	85%	\$0.46	0.00
Electric	School	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,051	25	\$4,749	95%	85%	\$0.46	0.00
Electric	School	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	142	9	\$20	100%	N/A	\$0.03	491,772
Electric	School	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	142	9	\$20	100%	N/A	\$0.03	540,147
Electric	School	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	Existing	489	4	\$1,835	10%	65%	\$1.32	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	142	9	\$20	100%	N/A	\$0.03	69,210
Electric	School	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	142	9	\$20	100%	N/A	\$0.03	74,541
Electric	School	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	New	488	4	\$1,835	10%	65%	\$1.33	0.00
Electric	School	Space Heat	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	358	15	\$1,292	25%	95%	\$0.47	0.00
Electric	School	Space Heat	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,688	15	\$78,602	15%	70%	\$3.82	0.00
Electric	School	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,344	5	\$1,616	75%	75%	\$0.35	0.00
Electric	School	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	224	18	\$6,205	45%	85%	\$3.28	0.00
Electric	School	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,344	14	\$23,451	5.0%	95%	\$2.38	0.00
Electric	School	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	403	12	\$5,450	25%	85%	\$2.03	0.00
Electric	School	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	896	12	\$682	10%	60%	\$0.11	0.00
Electric	School	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,763	25	\$10,350	45%	65%	\$0.60	0.00
Electric	School	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	223	25	\$4,982	25%	85%	\$2.27	0.00
Electric	School	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	268	20	\$3,392	45%	60%	\$1.42	0.00
Electric	School	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	268	20	\$5,191	45%	60%	\$2.17	0.00
Electric	School	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	161	20	\$592	45%	85%	\$0.41	0.00
Electric	School	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	161	20	\$910	45%	85%	\$0.63	0.00
Electric	School	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,155	25	\$18,476	15%	85%	\$0.87	0.00
Electric	School	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	401	25	\$5,701	15%	95%	\$1.45	0.00
Electric	School	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,849	25	\$45,423	10%	45%	\$1.62	0.00
Electric	School	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,120	7	\$5,096	90%	95%	\$1.01	0.00
Electric	School	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	293	7	\$19,133	95%	95%	\$14.43	0.00
Electric	School	Space Heat	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,344	5	\$1,616	25%	25%	\$0.35	0.00
Electric	School	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,344	14	\$23,451	5.0%	95%	\$2.38	0.00
Electric	School	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	403	12	\$5,450	25%	85%	\$2.03	0.00
Electric	School	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	223	25	\$4,982	75%	85%	\$2.27	0.00
Electric	School	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	161	20	\$592	45%	85%	\$0.41	0.00
Electric	School	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	161	20	\$910	45%	85%	\$0.63	0.00
Electric	School	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	401	25	\$5,701	15%	95%	\$1.45	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,086	25	\$4,749	95%	85%	\$0.45	0.00
Electric	School	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,073	10	\$284	100%	N/A	\$0.02	3,990,386
Electric	School	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	2,073	10	\$284	100%	N/A	\$0.02	4,170,337
Electric	School	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,073	10	\$284	100%	N/A	\$0.02	760,962
Electric	School	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	2,073	10	\$284	100%	N/A	\$0.02	817,733
Electric	School	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	13,463	10	\$3,169	5.0%	90%	\$0.04	2,250,204
Electric	School	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	Existing	13,463	10	\$3,169	5.0%	90%	\$0.04	2,474,980
Electric	School	Ventilation And Circulation	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	20,194	15	\$78,602	15%	70%	\$0.51	0.00
Electric	School	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	Existing	1,119	18	\$2,699	95%	85%	\$0.29	0.00
Electric	School	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	686	15	\$170	95%	90%	\$0.03	2,199,631
Electric	School	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	686	15	\$170	95%	90%	\$0.03	2,419,355
Electric	School	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	17,165	20	\$2,880	55%	65%	\$0.02	25,299,597
Electric	School	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	17,165	20	\$2,880	55%	65%	\$0.02	27,826,810
Electric	School	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	456	7	\$129	65%	25%	\$0.06	273,063
Electric	School	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	456	7	\$129	65%	25%	\$0.06	300,340
Electric	School	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	Existing	1,077	18	\$1,706	65%	85%	\$0.19	0.00
Electric	School	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	13,463	10	\$3,169	5.0%	90%	\$0.04	242,022
Electric	School	Ventilation And Circulation	Automated Exhaust VFD Control - Parking Garage CO sensor	CO Sensors	No CO Sensors	Per Building	New	13,463	10	\$3,169	5.0%	90%	\$0.04	342,013

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Ventilation And Circulation	Cooking Hood Controls	Demand-Ventilation Control	No Controls	Per Building	New	1,119	18	\$2,699	95%	85%	\$0.29	0.00
Electric	School	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	686	15	\$170	95%	90%	\$0.03	230,519
Electric	School	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	686	15	\$170	95%	90%	\$0.03	327,184
Electric	School	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	17,165	20	\$2,880	55%	45%	\$0.02	1,739,860
Electric	School	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	17,165	20	\$2,880	55%	45%	\$0.02	2,250,217
Electric	School	Ventilation And Circulation	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Building	New	1,077	18	\$1,706	63%	85%	\$0.19	0.00
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	262	9	\$100	25%	95%	\$0.07	0.00
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	123	14	\$41	5.0%	95%	\$0.05	2,652
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	123	14	\$41	5.0%	95%	\$0.05	3,057
Electric	School	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	663	10	\$7,182	55%	95%	\$1.84	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$74	20%	35%	\$0.42	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	452	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	452	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	380	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	380	12	\$235	70%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	132	12	\$113	75%	75%	\$0.13	0.00
Electric	School	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	2,653	25	\$3,599	2.5%	95%	\$0.14	0.00
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	512	9	\$2	95%	75%	\$0.00	311,520
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	512	9	\$2	95%	75%	\$0.00	359,051
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	211	9	\$0.00	95%	50%	\$0.00	85,515
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	211	9	\$0.00	95%	50%	\$0.00	98,563
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	79	9	\$25	95%	25%	\$0.06	13,419
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	79	9	\$25	95%	25%	\$0.06	15,466
Electric	School	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	773	4	\$235	95%	75%	\$0.11	0.00
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$23	95%	85%	\$0.02	128,334
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$23	95%	85%	\$0.02	147,915
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$56	95%	25%	\$0.05	30,441
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$56	95%	25%	\$0.05	35,086
Electric	School	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	331	10	\$393	75%	75%	\$0.20	0.00
Electric	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,512	10	\$328	25%	95%	\$0.04	279,648
Electric	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,512	10	\$504	25%	95%	\$0.06	321,070
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	7,922	15	\$1,450	75%	N/A	\$0.03	32,904
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	7,922	15	\$1,450	75%	N/A	\$0.03	36,515
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	7,829	15	\$866	75%	N/A	\$0.02	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	262	9	\$100	25%	95%	\$0.07	0.00
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	123	14	\$41	5.0%	95%	\$0.05	234
Electric	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	123	14	\$41	5.0%	95%	\$0.05	266
Electric	School	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	657	10	\$7,182	55%	95%	\$1.85	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$74	20%	35%	\$0.42	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	452	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	452	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	380	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	380	12	\$235	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$258	70%	95%	\$0.09	0.00
Electric	School	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	2,631	25	\$2,880	2.5%	95%	\$0.11	0.00
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	508	9	\$2	95%	75%	\$0.00	27,595
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	508	9	\$2	95%	75%	\$0.00	31,351
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	209	9	\$0.00	95%	50%	\$0.00	7,575

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	209	9	\$0.00	95%	50%	\$0.00	8,606
Electric	School	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	773	4	\$235	95%	75%	\$0.11	0.00
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$23	95%	85%	\$0.02	11,463
Electric	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$23	95%	85%	\$0.02	13,023
Electric	School	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	328	10	\$393	75%	75%	\$0.20	0.00
Electric	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,500	10	\$328	25%	95%	\$0.04	28,140
Electric	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,500	10	\$504	25%	95%	\$0.06	24,757
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	7,922	15	\$1,450	75%	N/A	\$0.03	5,398
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	7,922	15	\$1,450	75%	N/A	\$0.03	6,065
Electric	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	7,829	15	\$866	75%	N/A	\$0.02	0.00
Electric	School	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	262	9	\$100	25%	95%	\$0.07	0.00
Electric	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	123	14	\$41	5.0%	95%	\$0.05	6,153
Electric	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	123	14	\$41	5.0%	95%	\$0.05	7,092
Electric	School	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	693	10	\$7,182	25%	95%	\$1.76	0.00
Electric	School	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	26	12	\$74	75%	35%	\$0.42	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	452	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	452	12	\$258	75%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	380	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	380	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	414	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	138	12	\$113	75%	75%	\$0.12	0.00
Electric	School	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	2,773	25	\$3,599	2.5%	95%	\$0.13	0.00
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	535	9	\$2	95%	75%	\$0.00	755,208
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	535	9	\$2	95%	75%	\$0.00	870,428
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	220	9	\$0.00	95%	50%	\$0.00	207,312
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	220	9	\$0.00	95%	50%	\$0.00	238,941
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	83	9	\$25	95%	25%	\$0.06	32,531
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	83	9	\$25	95%	25%	\$0.06	37,495
Electric	School	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	773	4	\$235	95%	75%	\$0.11	0.00
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$23	95%	85%	\$0.02	297,703
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	223	10	\$23	95%	85%	\$0.02	343,122
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$56	95%	25%	\$0.05	70,617
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	180	10	\$56	95%	25%	\$0.05	81,391
Electric	School	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	346	10	\$393	75%	75%	\$0.19	0.00
Electric	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,580	10	\$328	25%	95%	\$0.04	678,360
Electric	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	1,580	10	\$504	25%	95%	\$0.05	781,507

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	7,326	15	\$7,449	75%	N/A	\$0.15	0.00
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	428	15	\$323	100%	N/A	\$0.10	0.00
Electric	School	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	262	9	\$100	25%	95%	\$0.07	0.00
Electric	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	123	14	\$41	5.0%	95%	\$0.05	703
Electric	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	123	14	\$41	5.0%	95%	\$0.05	801
Electric	School	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	672	10	\$7,182	25%	95%	\$1.81	0.00
Electric	School	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	26	12	\$74	75%	35%	\$0.42	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	452	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	452	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	380	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	380	12	\$235	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$258	75%	95%	\$0.09	0.00
Electric	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	414	12	\$258	75%	95%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	School	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	2,690	25	\$2,880	2.5%	95%	\$0.11	0.00
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	519	9	\$2	95%	75%	\$0.00	84,788
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	519	9	\$2	95%	75%	\$0.00	96,367
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	214	9	\$0.00	95%	50%	\$0.00	23,275
Electric	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	214	9	\$0.00	95%	50%	\$0.00	26,453
Electric	School	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	773	4	\$235	95%	75%	\$0.11	0.00
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$23	95%	85%	\$0.02	34,455
Electric	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	223	10	\$23	95%	85%	\$0.02	39,161
Electric	School	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	336	10	\$393	75%	75%	\$0.20	0.00
Electric	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,533	10	\$328	25%	95%	\$0.04	86,525
Electric	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	1,533	10	\$504	25%	95%	\$0.06	76,093
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	7,326	15	\$7,449	75%	N/A	\$0.15	204
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	7,326	15	\$7,449	75%	N/A	\$0.15	421
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	428	15	\$323	100%	N/A	\$0.10	-38.409972
Electric	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	428	15	\$323	100%	N/A	\$0.10	-323.222976
Electric	Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	1,524	4	\$173	100%	N/A	\$0.04	2,385,686
Electric	Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	1,524	4	\$173	100%	N/A	\$0.04	2,745,785
Electric	Small Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	2,351	4	\$174	95%	75%	\$0.03	46,572,266
Electric	Small Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	Existing	2,351	4	\$174	95%	75%	\$0.03	50,107,362
Electric	Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	1,524	4	\$173	100%	N/A	\$0.04	811,495
Electric	Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	1,524	4	\$173	100%	N/A	\$0.04	937,027
Electric	Small Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	2,351	4	\$174	95%	75%	\$0.03	5,474,470
Electric	Small Office	Computers	Network PC Power Management	Network PC Power Management	No Power Management	Per Building	New	2,351	4	\$174	95%	75%	\$0.03	6,537,421
Electric	Small Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,380	15	\$1,973	35%	95%	\$0.19	0.00
Electric	Small Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,558	15	\$1,973	35%	95%	\$0.17	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	374	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	958	15	\$646	100%	N/A	\$0.09	1,401,815
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	958	15	\$646	100%	N/A	\$0.09	1,412,562
Electric	Small Office	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	2,070	10	\$4,040	10%	20%	\$0.33	0.00
Electric	Small Office	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	2,338	10	\$4,040	10%	20%	\$0.29	0.00
Electric	Small Office	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	345	18	\$1,852	45%	85%	\$0.64	0.00
Electric	Small Office	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	389	18	\$1,852	45%	85%	\$0.56	0.00
Electric	Small Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	7,934	15	-\$13542.214	35%	N/A	-\$0.29	20,995,595
Electric	Small Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	7,934	15	-\$13542.214	35%	N/A	-\$0.29	27,904,041
Electric	Small Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,380	40	\$57,122	2.0%	100%	\$3.67	0.00
Electric	Small Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,558	40	\$57,122	2.0%	100%	\$3.25	0.00
Electric	Small Office	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	690	12	\$250	10%	60%	\$0.05	513,114
Electric	Small Office	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	779	12	\$250	10%	60%	\$0.05	417,453
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	22	25	\$2,969	45%	65%	\$13.51	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	25	25	\$2,969	45%	65%	\$11.96	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	4	25	\$1,429	25%	85%	\$30.37	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	5	25	\$1,429	25%	85%	\$26.89	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	414	20	\$260	45%	60%	\$0.07	1,381,252
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	467	20	\$347	45%	60%	\$0.08	1,116,007
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	248	20	\$46	45%	85%	\$0.02	1,190,901
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	280	20	\$61	45%	85%	\$0.02	955,182
Electric	Small Office	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,725	7	\$1,521	90%	95%	\$0.20	0.00
Electric	Small Office	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,948	7	\$1,521	90%	95%	\$0.17	0.00
Electric	Small Office	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,380	5	\$1,140	95%	50%	\$0.24	0.00
Electric	Small Office	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	1,558	5	\$1,140	95%	50%	\$0.21	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,087	10	\$2,210	35%	70%	\$0.35	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,087	10	\$2,210	35%	70%	\$0.35	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,952	10	\$2,210	35%	70%	\$0.19	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	1,952	10	\$2,210	35%	70%	\$0.19	0.00
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,741	25	\$23	15%	90%	\$0.00	3,794,052
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	1,966	25	\$23	15%	90%	\$0.00	3,065,471
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,588	25	\$351	15%	25%	\$0.02	741,332
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	1,793	25	\$351	15%	25%	\$0.02	603,125
Electric	Small Office	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	417	7	\$5,712	95%	95%	\$3.03	0.00
Electric	Small Office	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	467	7	\$5,712	95%	95%	\$2.71	0.00
Electric	Small Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,273	15	\$1,973	35%	95%	\$0.20	0.00
Electric	Small Office	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,426	15	\$1,973	35%	95%	\$0.18	0.00
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	374	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	958	15	\$517	100%	N/A	\$0.07	400,479
Electric	Small Office	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	958	15	\$517	100%	N/A	\$0.07	473,496
Electric	Small Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	7,934	15	-\$9872.601	35%	N/A	-\$0.21	3,954,223
Electric	Small Office	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	7,934	15	-\$9872.601	35%	N/A	-\$0.21	6,110,622
Electric	Small Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,273	40	\$57,122	2.0%	100%	\$3.98	0.00
Electric	Small Office	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,426	40	\$57,122	2.0%	100%	\$3.56	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	4	25	\$1,429	75%	85%	\$32.92	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	4	25	\$1,429	75%	85%	\$29.39	0.00
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	229	20	\$46	45%	85%	\$0.02	119,557
Electric	Small Office	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	256	20	\$61	45%	85%	\$0.03	82,174
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,087	10	\$2,210	0.0%	0%	\$0.35	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,087	10	\$2,210	0.0%	0%	\$0.35	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,952	10	\$2,210	0.0%	0%	\$0.19	0.00
Electric	Small Office	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	1,952	10	\$2,210	0.0%	0%	\$0.19	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,606	25	\$23	80%	90%	\$0.00	2,196,355
Electric	Small Office	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	1,799	25	\$23	80%	90%	\$0.00	1,509,607
Electric	Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	64	6	\$1	100%	N/A	\$0.01	1,827,335
Electric	Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	64	6	\$1	100%	N/A	\$0.01	1,849,558
Electric	Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	64	6	\$1	100%	N/A	\$0.01	275,986
Electric	Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	64	6	\$1	100%	N/A	\$0.01	325,144
Electric	Small Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	205	4	\$232	100%	N/A	\$0.40	0.00
Electric	Small Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	205	4	\$232	100%	N/A	\$0.40	164
Electric	Small Office	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	205	4	\$232	100%	N/A	\$0.40	229
Electric	Small Office	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	7	20	\$0.77	100%	N/A	\$0.01	0.00
Electric	Small Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	19	20	\$0.77	100%	N/A	\$0.00	182,703
Electric	Small Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	19	20	\$0.77	100%	N/A	\$0.00	-3346.72734
Electric	Small Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	132	20	\$18	8.8%	100%	\$0.02	397,796
Electric	Small Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	132	20	\$18	8.8%	100%	\$0.02	397,796
Electric	Small Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	155	20	\$18	8.8%	100%	\$0.01	436,496
Electric	Small Office	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	155	20	\$18	8.8%	100%	\$0.01	436,496
Electric	Small Office	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	7	20	\$0.77	100%	N/A	\$0.01	0.00
Electric	Small Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	19	20	\$0.77	100%	N/A	\$0.00	63,396
Electric	Small Office	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	19	20	\$0.77	100%	N/A	\$0.00	-434.55732
Electric	Small Office	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	692	15	\$2,406	100%	N/A	\$0.45	0.00
Electric	Small Office	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	1,468	15	\$4,813	100%	N/A	\$0.43	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	561	15	\$1,973	35%	95%	\$0.46	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	561	15	\$1,973	35%	95%	\$0.46	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,144	15	\$1,973	35%	95%	\$0.23	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	1,144	15	\$1,973	35%	95%	\$0.23	0.00
Electric	Small Office	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	428	18	\$1,852	45%	85%	\$0.51	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	852	14	\$13,276	5.0%	95%	\$2.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	852	14	\$13,276	5.0%	95%	\$2.12	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,727	14	\$13,276	5.0%	95%	\$1.05	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,727	14	\$13,276	5.0%	95%	\$1.05	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	561	40	\$57,122	2.0%	100%	\$9.04	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	561	40	\$57,122	2.0%	100%	\$9.04	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,144	40	\$57,122	2.0%	100%	\$4.43	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	1,144	40	\$57,122	2.0%	100%	\$4.43	0.00
Electric	Small Office	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	5,029	30	\$42,711	5.0%	N/A	\$2.65	0.00
Electric	Small Office	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,284	12	\$250	10%	60%	\$0.03	152,635
Electric	Small Office	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,284	12	\$250	10%	60%	\$0.03	727,243
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	675	25	\$2,969	45%	65%	\$0.45	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	675	25	\$2,969	45%	65%	\$0.45	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,341	25	\$2,969	45%	65%	\$0.23	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,341	25	\$2,969	45%	65%	\$0.23	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	144	25	\$1,429	25%	85%	\$1.01	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	144	25	\$1,429	25%	85%	\$1.01	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	287	25	\$1,429	25%	85%	\$0.51	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	287	25	\$1,429	25%	85%	\$0.51	0.00
Electric	Small Office	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	513	20	\$260	45%	60%	\$0.06	272,982
Electric	Small Office	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	513	20	\$347	45%	60%	\$0.08	1,291,693
Electric	Small Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	308	20	\$46	45%	85%	\$0.02	235,150
Electric	Small Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	308	20	\$61	45%	85%	\$0.02	1,107,675
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,199	25	\$5,300	15%	85%	\$0.45	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,199	25	\$5,300	15%	85%	\$0.45	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3,148	25	\$5,300	15%	85%	\$0.17	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3,148	25	\$5,300	15%	85%	\$0.17	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	236	25	\$1,634	15%	95%	\$0.70	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	236	25	\$1,634	15%	95%	\$0.70	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	612	25	\$1,634	15%	95%	\$0.27	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	612	25	\$1,634	15%	95%	\$0.27	0.00
Electric	Small Office	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,732	25	\$13,031	10%	45%	\$0.49	0.00
Electric	Small Office	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,141	7	\$1,521	90%	95%	\$0.16	0.00
Electric	Small Office	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,141	7	\$1,521	90%	95%	\$0.16	20,483,915
Electric	Small Office	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	1,713	3	\$1,140	95%	50%	\$0.30	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	356	10	\$2,210	35%	70%	\$1.05	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	356	10	\$2,210	35%	70%	\$1.05	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,305	10	\$2,210	35%	70%	\$0.29	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	1,305	10	\$2,210	35%	70%	\$0.29	0.00
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	662	25	\$23	15%	90%	\$0.00	226,902
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	662	25	\$23	15%	90%	\$0.00	1,073,656
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	876	25	\$351	15%	25%	\$0.04	64,752
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	876	25	\$351	15%	25%	\$0.04	306,393
Electric	Small Office	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	692	15	\$1,925	100%	N/A	\$0.36	0.00
Electric	Small Office	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,468	15	\$3,851	100%	N/A	\$0.34	243
Electric	Small Office	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,468	15	\$3,851	100%	N/A	\$0.34	631
Electric	Small Office	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	528	7	\$5,712	95%	95%	\$2.40	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	527	15	\$1,973	35%	95%	\$0.49	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	527	15	\$1,973	35%	95%	\$0.49	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,076	15	\$1,973	35%	95%	\$0.24	0.00
Electric	Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	1,076	15	\$1,973	35%	95%	\$0.24	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	801	14	\$13,276	5.0%	95%	\$2.26	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	801	14	\$13,276	5.0%	95%	\$2.26	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,625	14	\$13,276	5.0%	95%	\$1.11	0.00
Electric	Small Office	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,625	14	\$13,276	5.0%	95%	\$1.11	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	527	40	\$57,122	2.0%	100%	\$9.61	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	527	40	\$57,122	2.0%	100%	\$9.61	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,076	40	\$57,122	2.0%	100%	\$4.71	0.00
Electric	Small Office	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	1,076	40	\$57,122	2.0%	100%	\$4.71	0.00
Electric	Small Office	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	5,029	30	\$73,308	5.0%	N/A	\$1.34	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	136	25	\$1,429	75%	85%	\$1.07	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	136	25	\$1,429	75%	85%	\$1.07	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	270	25	\$1,429	75%	85%	\$0.54	0.00
Electric	Small Office	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	270	25	\$1,429	75%	85%	\$0.54	0.00
Electric	Small Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	290	20	\$46	45%	85%	\$0.02	25,704
Electric	Small Office	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	290	20	\$61	45%	85%	\$0.02	103,895
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	222	25	\$1,634	15%	95%	\$0.75	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	222	25	\$1,634	15%	95%	\$0.75	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	576	25	\$1,634	15%	95%	\$0.29	0.00
Electric	Small Office	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	576	25	\$1,634	15%	95%	\$0.29	0.00
Electric	Small Office	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	237	25	\$1,362	95%	85%	\$0.58	0.00
Electric	Small Office	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	237	25	\$1,362	95%	85%	\$0.58	178,515
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	356	10	\$2,210	0.0%	0%	\$1.05	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	356	10	\$2,210	0.0%	0%	\$1.05	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,305	10	\$2,210	0.0%	0%	\$0.29	0.00
Electric	Small Office	Heat Pump	Window Film	Window Film	No Film	Per Building	New	1,305	10	\$2,210	0.0%	0%	\$0.29	0.00
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	623	25	\$23	80%	90%	\$0.00	135,361
Electric	Small Office	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	623	25	\$23	80%	90%	\$0.00	547,115
Electric	Small Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	2,141	8	\$510	75%	70%	\$0.05	0.00
Electric	Small Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,778	15	\$466	62%	90%	\$0.03	33,974,690
Electric	Small Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,778	15	\$622	62%	90%	\$0.05	0.00
Electric	Small Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	760	8	\$274	90%	90%	\$0.07	0.00
Electric	Small Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	760	8	\$365	90%	90%	\$0.10	0.00
Electric	Small Office	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	1,406	17	\$955	75%	50%	\$0.08	0.00
Electric	Small Office	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	741	8	\$29	25%	25%	\$0.01	1,585,587
Electric	Small Office	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	741	8	\$38	25%	25%	\$0.01	1,666,481
Electric	Small Office	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	2,141	8	\$510	75%	70%	\$0.05	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,778	15	\$466	62%	90%	\$0.03	4,463,169
Electric	Small Office	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,778	15	\$622	62%	90%	\$0.05	0.00
Electric	Small Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	760	8	\$274	90%	90%	\$0.07	0.00
Electric	Small Office	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	760	8	\$365	90%	90%	\$0.10	0.00
Electric	Small Office	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	1,406	17	\$955	75%	50%	\$0.08	0.00
Electric	Small Office	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	548	10	\$124	0.5%	75%	\$0.04	59,227
Electric	Small Office	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	548	10	\$165	0.5%	75%	\$0.05	64,645
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	6,627	8	\$6,007	30%	80%	\$0.18	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	6,627	8	\$6,007	30%	80%	\$0.18	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,409	8	\$6,007	30%	80%	\$0.16	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,409	8	\$6,007	30%	80%	\$0.16	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,970	8	\$4,505	30%	80%	\$0.18	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	4,970	8	\$4,505	30%	80%	\$0.18	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,557	8	\$4,505	30%	80%	\$0.16	0.00
Electric	Small Office	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,557	8	\$4,505	30%	80%	\$0.16	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,711	13	\$20,328	50%	N/A	\$0.80	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,711	13	\$20,328	50%	N/A	\$0.80	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,854	13	\$20,283	50%	N/A	\$0.77	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	3,854	13	\$20,283	50%	N/A	\$0.77	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	831	13	\$514	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	831	13	\$514	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	863	13	\$592	100%	N/A	\$0.12	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	863	13	\$592	100%	N/A	\$0.12	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,527	13	\$1,031	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,527	13	\$1,031	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,586	13	\$1,110	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,586	13	\$1,110	100%	N/A	\$0.11	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,727	13	\$3,133	100%	N/A	\$0.32	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,727	13	\$3,133	100%	N/A	\$0.32	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,794	13	\$3,390	100%	N/A	\$0.33	0.00
Electric	Small Office	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,794	13	\$3,390	100%	N/A	\$0.33	0.00
Electric	Small Office	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,113	8	\$274	75%	90%	\$0.03	43,295,275
Electric	Small Office	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,113	8	\$365	75%	90%	\$0.03	47,255,619
Electric	Small Office	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,058	8	\$29	5.0%	25%	\$0.00	939,326
Electric	Small Office	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,058	8	\$38	5.0%	25%	\$0.00	1,025,249
Electric	Small Office	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	186	15	\$123	100%	N/A	\$0.10	0.00
Electric	Small Office	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	244	15	\$506	95%	N/A	\$0.27	0.00
Electric	Small Office	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	206	25	\$3,719	50%	N/A	\$1.79	0.00
Electric	Small Office	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	125	17	\$5	25%	N/A	\$-0.03	229,110

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	125	17	\$5	25%	N/A	\$-0.03	232,270
Electric	Small Office	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	56	15	\$2,352	100%	N/A	\$5.28	0.00
Electric	Small Office	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	81	8	\$274	75%	90%	\$0.68	0.00
Electric	Small Office	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	81	8	\$365	75%	90%	\$0.90	0.00
Electric	Small Office	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	78	8	\$29	10%	25%	\$0.07	0.00
Electric	Small Office	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	78	8	\$38	10%	25%	\$0.10	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	35	11	\$13	95%	65%	\$0.06	743,116
Electric	Small Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	35	11	\$13	95%	65%	\$0.06	743,116
Electric	Small Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	46	11	\$18	95%	65%	\$0.06	1,041,295
Electric	Small Office	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	46	11	\$18	95%	65%	\$0.06	1,041,295
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	7	13	\$6	95%	95%	\$0.13	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	7	13	\$6	95%	95%	\$0.13	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	9	13	\$7	95%	95%	\$0.12	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	9	13	\$7	95%	95%	\$0.12	0.00
Electric	Small Office	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	465	10	\$124	0.5%	75%	\$0.05	7,602
Electric	Small Office	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	465	10	\$165	0.5%	75%	\$0.06	6,219
Electric	Small Office	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,917	8	\$6,007	30%	80%	\$0.24	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,917	8	\$6,007	30%	80%	\$0.24	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,498	8	\$6,007	30%	80%	\$0.22	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,498	8	\$6,007	30%	80%	\$0.22	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,688	8	\$4,505	30%	80%	\$0.24	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	3,688	8	\$4,505	30%	80%	\$0.24	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,123	8	\$4,505	30%	80%	\$0.22	0.00
Electric	Small Office	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,123	8	\$4,505	30%	80%	\$0.22	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	7	13	\$6	95%	95%	\$0.13	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	7	13	\$6	95%	95%	\$0.13	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	9	13	\$7	95%	95%	\$0.12	0.00
Electric	Small Office	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	9	13	\$7	95%	95%	\$0.12	0.00
Electric	Small Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	1,861	13	\$2,084	100%	N/A	\$0.16	0.00
Electric	Small Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	1,861	13	\$2,084	100%	N/A	\$0.16	0.00
Electric	Small Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,560	13	\$3,024	100%	N/A	\$0.17	0.00
Electric	Small Office	Lighting Interior Other	Lighting Package - High Efficiency	11% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,560	13	\$3,024	100%	N/A	\$0.17	0.00
Electric	Small Office	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,792	8	\$274	75%	90%	\$0.03	5,557,486
Electric	Small Office	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,792	8	\$365	75%	90%	\$0.04	4,546,495
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,205	4	\$29	85%	N/A	\$-0.02	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,205	4	\$29	85%	N/A	\$-0.02	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,928	4	\$54	85%	N/A	\$-0.02	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,928	4	\$54	85%	N/A	\$-0.02	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,679	1	\$8	100%	N/A	\$0.01	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,679	1	\$8	100%	N/A	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,956	1	\$16	100%	N/A	\$0.01	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,956	1	\$16	100%	N/A	\$0.01	0.00
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,229	12	\$743	85%	N/A	\$0.02	9,246,329
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,229	12	\$743	85%	N/A	\$0.02	9,246,329
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,973	12	\$1,376	85%	N/A	\$0.02	16,886,972
Electric	Small Office	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,973	12	\$1,376	85%	N/A	\$0.02	16,886,972
Electric	Small Office	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	296	8	\$274	75%	90%	\$0.19	0.00
Electric	Small Office	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	296	8	\$365	75%	90%	\$0.25	0.00
Electric	Small Office	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	288	8	\$29	1.0%	25%	\$0.02	11,894
Electric	Small Office	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	288	8	\$38	1.0%	25%	\$0.03	6,758
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.77	10%	90%	\$0.09	5,993
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.77	10%	90%	\$0.09	5,993
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	4	7	\$0.77	10%	90%	\$0.04	12,982
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	4	7	\$0.77	10%	90%	\$0.04	12,982
Electric	Small Office	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	98	4	\$0.00	75%	45%	\$0.00	0.00
Electric	Small Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	181	10	\$0.77	95%	75%	\$0.00	5,164,371
Electric	Small Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	181	10	\$0.77	95%	75%	\$0.00	5,556,375
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	300	4	\$60	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	300	4	\$60	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	400	4	\$79	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	400	4	\$79	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.77	10%	90%	\$0.09	803

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.77	10%	90%	\$0.09	803
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	4	7	\$0.77	10%	90%	\$0.04	1,354
Electric	Small Office	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	4	7	\$0.77	10%	90%	\$0.04	1,354
Electric	Small Office	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	98	4	\$0.00	75%	45%	\$0.00	0.00
Electric	Small Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	181	10	\$0.77	95%	75%	\$0.00	579,726
Electric	Small Office	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	181	10	\$0.77	95%	75%	\$0.00	692,289
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	300	4	\$60	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	300	4	\$60	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	400	4	\$79	60%	90%	\$0.07	0.00
Electric	Small Office	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	400	4	\$79	60%	90%	\$0.07	0.00
Electric	Small Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	174	6	\$217	100%	N/A	\$0.31	0.00
Electric	Small Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	174	6	\$217	100%	N/A	\$0.31	187
Electric	Small Office	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	174	6	\$217	100%	N/A	\$0.31	285
Electric	Small Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	322	6	\$47	100%	N/A	\$0.04	82,825
Electric	Small Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	322	6	\$47	100%	N/A	\$0.04	150,044
Electric	Small Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	322	6	\$47	100%	N/A	\$0.04	0.00
Electric	Small Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	236	20	\$642	100%	N/A	\$0.31	0.00
Electric	Small Office	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	265	20	\$862	100%	N/A	\$0.37	0.00
Electric	Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	207	20	\$50	100%	N/A	\$0.03	715,586
Electric	Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	207	20	\$50	100%	N/A	\$0.03	777,247
Electric	Small Office	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	66	20	\$23	100%	N/A	\$0.04	0.00
Electric	Small Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,620	20	\$171	8.8%	100%	\$0.01	3,738,813
Electric	Small Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,620	20	\$171	8.8%	100%	\$0.01	3,738,813
Electric	Small Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,653	20	\$165	8.8%	100%	\$0.01	4,104,633
Electric	Small Office	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	1,653	20	\$165	8.8%	100%	\$0.01	4,104,633
Electric	Small Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	236	20	\$642	100%	N/A	\$0.31	0.00
Electric	Small Office	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	265	20	\$862	100%	N/A	\$0.37	0.00
Electric	Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	207	20	\$50	100%	N/A	\$0.03	332,621
Electric	Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	207	20	\$50	100%	N/A	\$0.03	337,180

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	66	20	\$23	100%	N/A	\$0.04	0.00
Electric	Small Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	212	15	\$1,973	35%	95%	\$1.22	0.00
Electric	Small Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	269	15	\$1,973	35%	95%	\$0.96	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	388	15	\$16,766	2.5%	65%	\$5.64	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	494	15	\$16,766	2.5%	65%	\$4.43	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	388	15	\$13,848	2.5%	65%	\$4.66	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	494	15	\$13,848	2.5%	65%	\$3.66	0.00
Electric	Small Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	212	40	\$57,122	2.0%	100%	\$23.91	0.00
Electric	Small Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	269	40	\$57,122	2.0%	100%	\$18.78	0.00
Electric	Small Office	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	106	12	\$250	10%	60%	\$0.36	26,507
Electric	Small Office	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	134	12	\$250	10%	60%	\$0.28	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	3	25	\$2,969	45%	65%	\$87.94	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4	25	\$2,969	45%	65%	\$69.07	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.73	25	\$1,429	25%	85%	\$197.67	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.93	25	\$1,429	25%	85%	\$155.25	0.00
Electric	Small Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	198	9	\$50	100%	N/A	\$0.05	97,854
Electric	Small Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	252	9	\$50	100%	N/A	\$0.04	317,657
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	267	25	\$23	15%	90%	\$0.01	193,813
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	340	25	\$23	15%	90%	\$0.01	217,743
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	244	25	\$351	15%	25%	\$0.15	0.00
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	310	25	\$351	15%	25%	\$0.12	42,840
Electric	Small Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	212	15	\$1,973	35%	95%	\$1.22	0.00
Electric	Small Office	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	269	15	\$1,973	35%	95%	\$0.96	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	388	15	\$13,413	2.5%	65%	\$4.51	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	494	15	\$13,413	2.5%	65%	\$3.54	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	388	15	\$11,079	2.5%	65%	\$3.73	0.00
Electric	Small Office	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	494	15	\$11,079	2.5%	65%	\$2.93	0.00
Electric	Small Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	212	40	\$57,122	2.0%	100%	\$23.91	0.00
Electric	Small Office	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	269	40	\$57,122	2.0%	100%	\$18.78	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.73	25	\$1,429	75%	85%	\$197.67	0.00
Electric	Small Office	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.93	25	\$1,429	75%	85%	\$155.25	0.00
Electric	Small Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	198	9	\$50	100%	N/A	\$0.05	33,433
Electric	Small Office	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	252	9	\$50	100%	N/A	\$0.04	73,346
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	267	25	\$23	80%	90%	\$0.01	102,741
Electric	Small Office	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	340	25	\$23	80%	90%	\$0.01	134,952
Electric	Small Office	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	2,420	15	\$13,855	2.5%	65%	\$0.75	0.00
Electric	Small Office	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	389	12	\$250	10%	60%	\$0.10	0.00
Electric	Small Office	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	453	25	\$2,969	45%	65%	\$0.67	0.00
Electric	Small Office	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	97	25	\$1,429	25%	85%	\$1.50	0.00
Electric	Small Office	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	937	25	\$5,300	15%	85%	\$0.58	0.00
Electric	Small Office	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	174	25	\$1,634	15%	95%	\$0.95	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	472	25	\$13,031	10%	45%	\$2.81	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	472	25	\$13,031	10%	45%	\$2.81	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,240	25	\$13,031	10%	45%	\$1.07	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,240	25	\$13,031	10%	45%	\$1.07	0.00
Electric	Small Office	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	2,420	15	\$9,500	2.5%	65%	\$0.51	0.00
Electric	Small Office	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	97	25	\$1,429	75%	85%	\$1.50	0.00
Electric	Small Office	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	174	25	\$1,634	15%	95%	\$0.95	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	472	25	\$1,362	95%	85%	\$0.29	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	472	25	\$1,362	95%	85%	\$0.29	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,240	25	\$1,362	95%	85%	\$0.11	0.00
Electric	Small Office	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,240	25	\$1,362	95%	85%	\$0.11	0.00
Electric	Small Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	157	9	\$20	100%	N/A	\$0.02	3,225,394
Electric	Small Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	157	9	\$20	100%	N/A	\$0.02	3,245,669
Electric	Small Office	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	Existing	542	4	\$2,035	10%	65%	\$1.32	0.00
Electric	Small Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	157	9	\$20	100%	N/A	\$0.02	415,875
Electric	Small Office	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	157	9	\$20	100%	N/A	\$0.02	488,893
Electric	Small Office	Servers	Server Virtualization	Server Virtualization	No Virtualization	Per Building	New	541	4	\$2,035	10%	65%	\$1.33	0.00
Electric	Small Office	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	156	18	\$1,852	45%	85%	\$1.40	0.00
Electric	Small Office	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	936	14	\$13,276	5.0%	95%	\$1.93	0.00
Electric	Small Office	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	624	12	\$250	10%	60%	\$0.06	0.00
Electric	Small Office	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	726	25	\$2,969	45%	65%	\$0.42	0.00
Electric	Small Office	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	155	25	\$1,429	25%	85%	\$0.94	0.00
Electric	Small Office	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	187	20	\$260	45%	60%	\$0.16	0.00
Electric	Small Office	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	187	20	\$347	45%	60%	\$0.21	0.00
Electric	Small Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	112	20	\$46	45%	85%	\$0.05	222,473
Electric	Small Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	112	20	\$61	45%	85%	\$0.06	0.00
Electric	Small Office	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,501	25	\$5,300	15%	85%	\$0.36	0.00
Electric	Small Office	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	279	25	\$1,634	15%	95%	\$0.60	0.00
Electric	Small Office	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,985	25	\$13,031	10%	45%	\$0.67	0.00
Electric	Small Office	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	780	7	\$1,521	90%	95%	\$0.43	0.00
Electric	Small Office	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	204	7	\$5,712	95%	95%	\$6.19	0.00
Electric	Small Office	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	936	14	\$13,276	5.0%	95%	\$1.93	0.00
Electric	Small Office	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	155	25	\$1,429	75%	85%	\$0.94	0.00
Electric	Small Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	112	20	\$46	45%	85%	\$0.05	25,988
Electric	Small Office	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	112	20	\$61	45%	85%	\$0.06	0.00
Electric	Small Office	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	279	25	\$1,634	15%	95%	\$0.60	0.00
Electric	Small Office	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	756	25	\$1,362	95%	85%	\$0.18	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	626	10	\$85	100%	N/A	\$0.02	6,834,765
Electric	Small Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	626	10	\$85	100%	N/A	\$0.02	7,138,284
Electric	Small Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	626	10	\$85	100%	N/A	\$0.02	1,247,142
Electric	Small Office	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	626	10	\$85	100%	N/A	\$0.02	1,462,818
Electric	Small Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	71	15	\$50	95%	90%	\$0.09	0.00
Electric	Small Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	1,791	20	\$859	55%	65%	\$0.05	10,563,551
Electric	Small Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	1,791	20	\$859	55%	65%	\$0.05	14,318,337
Electric	Small Office	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	136	7	\$38	65%	25%	\$0.06	0.00
Electric	Small Office	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	71	15	\$50	95%	90%	\$0.09	0.00
Electric	Small Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	1,791	20	\$859	55%	45%	\$0.05	726,458
Electric	Small Office	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	1,791	20	\$859	55%	45%	\$0.05	1,157,853
Electric	Small Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	58	10	\$2,144	55%	80%	\$6.28	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	6	12	\$17	90%	35%	\$0.42	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	11	12	\$31	75%	75%	\$0.41	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	232	25	\$1,000	2.5%	95%	\$0.44	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	44	9	\$0.00	95%	75%	\$0.00	20,572
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	44	9	\$0.00	95%	75%	\$0.00	21,721
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	18	9	\$0.00	95%	50%	\$0.00	5,647
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	18	9	\$0.00	95%	50%	\$0.00	5,962

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	6	9	\$4	95%	25%	\$0.12	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	6	9	\$5	95%	25%	\$0.14	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	29	10	\$59	75%	85%	\$0.35	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	29	10	\$77	75%	85%	\$0.46	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	692	15	\$402	75%	N/A	\$0.10	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	684	15	\$240	75%	N/A	\$0.07	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	57	10	\$2,144	55%	80%	\$6.33	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	6	12	\$17	90%	35%	\$0.42	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	230	25	\$800	2.5%	95%	\$0.35	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	44	9	\$0.00	95%	75%	\$0.00	1,649
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	44	9	\$0.00	95%	75%	\$0.00	2,073
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	18	9	\$0.00	95%	50%	\$0.00	452
Electric	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	18	9	\$0.00	95%	50%	\$0.00	569
Electric	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	28	10	\$59	75%	85%	\$0.35	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	28	10	\$77	75%	85%	\$0.46	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	692	15	\$402	75%	N/A	\$0.10	0.00
Electric	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	684	15	\$240	75%	N/A	\$0.07	0.00
Electric	Small Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	60	10	\$2,144	25%	80%	\$6.01	0.00
Electric	Small Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	6	12	\$17	75%	35%	\$0.42	0.00
Electric	Small Office	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	12	12	\$31	75%	75%	\$0.39	0.00
Electric	Small Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	242	25	\$1,000	2.5%	95%	\$0.42	0.00
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	46	9	\$0.00	95%	75%	\$0.00	591,891
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	46	9	\$0.00	95%	75%	\$0.00	625,002

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	19	9	\$0.00	95%	50%	\$0.00	162,480
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	19	9	\$0.00	95%	50%	\$0.00	171,569
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$4	95%	25%	\$0.12	0.00
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$5	95%	25%	\$0.14	0.00
Electric	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	30	10	\$59	75%	85%	\$0.33	0.00
Electric	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	30	10	\$77	75%	85%	\$0.44	0.00
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	640	15	\$2,069	75%	N/A	\$0.47	0.00
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	37	15	\$90	100%	N/A	\$0.32	0.00
Electric	Small Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	58	10	\$2,144	25%	80%	\$6.19	0.00
Electric	Small Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	6	12	\$17	75%	35%	\$0.42	0.00
Electric	Small Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	235	25	\$800	2.5%	95%	\$0.35	0.00
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	45	9	\$0.00	95%	75%	\$0.00	60,881
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	45	9	\$0.00	95%	75%	\$0.00	75,527
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	18	9	\$0.00	95%	50%	\$0.00	16,712
Electric	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	18	9	\$0.00	95%	50%	\$0.00	20,733
Electric	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	29	10	\$59	75%	85%	\$0.34	0.00
Electric	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	29	10	\$77	75%	85%	\$0.45	0.00
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	640	15	\$2,069	75%	N/A	\$0.47	154
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	640	15	\$2,069	75%	N/A	\$0.47	346
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	37	15	\$90	100%	N/A	\$0.32	-28.888728
Electric	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	37	15	\$90	100%	N/A	\$0.32	-265.643496
Electric	Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	195	4	\$22	100%	N/A	\$0.04	179,293
Electric	Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	195	4	\$22	100%	N/A	\$0.04	195,021
Electric	Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	195	4	\$22	100%	N/A	\$0.04	52,679
Electric	Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	195	4	\$22	100%	N/A	\$0.04	60,933

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	312	15	\$1,832	80%	95%	\$0.77	0.00
Electric	Small Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	382	15	\$1,832	80%	95%	\$0.63	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	109	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	279	15	\$712	100%	N/A	\$0.33	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	469	10	\$4,453	10%	80%	\$1.61	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	574	10	\$4,453	10%	80%	\$1.32	0.00
Electric	Small Retail	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	78	18	\$1,256	45%	85%	\$1.90	0.00
Electric	Small Retail	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	95	18	\$1,256	45%	85%	\$1.55	0.00
Electric	Small Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	2,314	15	\$-14926.789	35%	N/A	\$-1.08	1,179,605
Electric	Small Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	2,314	15	\$-14926.789	35%	N/A	\$-1.08	1,376,319
Electric	Small Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	312	40	\$53,039	2.0%	100%	\$15.05	0.00
Electric	Small Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	382	40	\$53,039	2.0%	100%	\$12.29	0.00
Electric	Small Retail	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	156	12	\$146	10%	60%	\$0.14	35,068
Electric	Small Retail	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	191	12	\$146	10%	60%	\$0.11	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	12	25	\$2,757	45%	65%	\$23.25	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	14	25	\$2,757	45%	65%	\$18.99	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1	25	\$1,326	25%	85%	\$124.29	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	1	25	\$1,326	25%	85%	\$101.54	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	93	20	\$469	45%	60%	\$0.56	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	114	20	\$522	45%	60%	\$0.51	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	56	20	\$82	45%	85%	\$0.16	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	68	20	\$91	45%	85%	\$0.15	0.00
Electric	Small Retail	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	391	7	\$1,032	90%	95%	\$0.59	0.00
Electric	Small Retail	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	478	7	\$1,032	90%	95%	\$0.48	0.00
Electric	Small Retail	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	312	5	\$1,256	95%	50%	\$1.17	0.00
Electric	Small Retail	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	382	5	\$1,256	95%	50%	\$0.96	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	725	10	\$1,292	35%	70%	\$0.30	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	725	10	\$1,292	35%	70%	\$0.30	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	840	10	\$1,292	35%	70%	\$0.26	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	840	10	\$1,292	35%	70%	\$0.26	0.00
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	394	25	\$13	15%	90%	\$0.00	256,408
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	483	25	\$13	15%	90%	\$0.00	287,695
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	360	25	\$205	15%	25%	\$0.06	50,296
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	440	25	\$205	15%	25%	\$0.05	56,603
Electric	Small Retail	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	96	7	\$3,874	95%	95%	\$8.89	0.00
Electric	Small Retail	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	116	7	\$3,874	95%	95%	\$7.39	0.00
Electric	Small Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	294	15	\$1,832	80%	95%	\$0.81	0.00
Electric	Small Retail	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	354	15	\$1,832	80%	95%	\$0.68	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	109	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Small Retail	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	279	15	\$570	100%	N/A	\$0.27	0.00
Electric	Small Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	2,314	15	\$-10881.979	35%	N/A	\$-0.81	201,544
Electric	Small Retail	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	2,314	15	\$-10881.979	35%	N/A	\$-0.81	230,940
Electric	Small Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	294	40	\$53,039	2.0%	100%	\$15.97	0.00
Electric	Small Retail	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	354	40	\$53,039	2.0%	100%	\$13.27	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1	25	\$1,326	75%	85%	\$131.94	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	1	25	\$1,326	75%	85%	\$109.64	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	53	20	\$82	45%	85%	\$0.17	0.00
Electric	Small Retail	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	63	20	\$91	45%	85%	\$0.16	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	725	10	\$1,292	0.0%	0%	\$0.30	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	725	10	\$1,292	0.0%	0%	\$0.30	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	840	10	\$1,292	0.0%	0%	\$0.26	0.00
Electric	Small Retail	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	840	10	\$1,292	0.0%	0%	\$0.26	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	371	25	\$13	80%	90%	\$0.00	93,438
Electric	Small Retail	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	447	25	\$13	80%	90%	\$0.00	104,482
Electric	Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	15	6	\$0.00	100%	N/A	\$0.00	130,019
Electric	Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	15	6	\$0.00	100%	N/A	\$0.00	132,429
Electric	Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	15	6	\$0.00	100%	N/A	\$0.00	19,760
Electric	Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	15	6	\$0.00	100%	N/A	\$0.00	23,134
Electric	Small Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	26	4	\$29	100%	N/A	\$0.40	0.00
Electric	Small Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	26	4	\$29	100%	N/A	\$0.40	6
Electric	Small Retail	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	26	4	\$29	100%	N/A	\$0.40	8
Electric	Small Retail	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	3	20	\$0.52	100%	N/A	\$0.02	0.00
Electric	Small Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	9	20	\$0.52	100%	N/A	\$0.01	21,458
Electric	Small Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	9	20	\$0.52	100%	N/A	\$0.01	-390.62154
Electric	Small Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	62	20	\$8	8.8%	100%	\$0.02	54,619
Electric	Small Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	62	20	\$8	8.8%	100%	\$0.02	54,619
Electric	Small Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	74	20	\$8	8.8%	100%	\$0.01	59,557
Electric	Small Retail	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	74	20	\$8	8.8%	100%	\$0.01	59,557
Electric	Small Retail	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	3	20	\$0.52	100%	N/A	\$0.02	0.00
Electric	Small Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	9	20	\$0.52	100%	N/A	\$0.01	7,446
Electric	Small Retail	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	9	20	\$0.52	100%	N/A	\$0.01	-50.7204
Electric	Small Retail	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	195	15	\$2,653	100%	N/A	\$1.78	0.00
Electric	Small Retail	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	398	15	\$5,306	100%	N/A	\$1.74	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	206	15	\$1,832	80%	95%	\$1.16	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	206	15	\$1,832	80%	95%	\$1.16	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	300	15	\$1,832	80%	95%	\$0.80	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	300	15	\$1,832	80%	95%	\$0.80	0.00
Electric	Small Retail	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	123	18	\$1,256	45%	85%	\$1.20	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	292	14	\$9,005	5.0%	95%	\$4.19	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	292	14	\$9,005	5.0%	95%	\$4.19	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	433	14	\$9,005	5.0%	95%	\$2.83	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	433	14	\$9,005	5.0%	95%	\$2.83	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	206	40	\$53,039	2.0%	100%	\$22.80	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	206	40	\$53,039	2.0%	100%	\$22.80	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	300	40	\$53,039	2.0%	100%	\$15.67	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	300	40	\$53,039	2.0%	100%	\$15.67	0.00
Electric	Small Retail	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	1,426	30	\$57,304	5.0%	N/A	\$10.29	0.00
Electric	Small Retail	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	371	12	\$146	10%	60%	\$0.06	0.00
Electric	Small Retail	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	371	12	\$146	10%	60%	\$0.06	19,182
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	390	25	\$2,757	45%	65%	\$0.72	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	390	25	\$2,757	45%	65%	\$0.72	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	570	25	\$2,757	45%	65%	\$0.49	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	570	25	\$2,757	45%	65%	\$0.49	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	49	25	\$1,326	25%	85%	\$2.73	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	49	25	\$1,326	25%	85%	\$2.73	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	72	25	\$1,326	25%	85%	\$1.87	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	72	25	\$1,326	25%	85%	\$1.87	0.00
Electric	Small Retail	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	148	20	\$469	45%	60%	\$0.35	0.00
Electric	Small Retail	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	148	20	\$522	45%	60%	\$0.39	0.00
Electric	Small Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	89	20	\$82	45%	85%	\$0.10	29,148
Electric	Small Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	89	20	\$91	45%	85%	\$0.11	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	449	25	\$4,921	15%	85%	\$1.11	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	449	25	\$4,921	15%	85%	\$1.11	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	763	25	\$4,921	15%	85%	\$0.66	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	763	25	\$4,921	15%	85%	\$0.66	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	88	25	\$1,518	15%	95%	\$1.75	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	88	25	\$1,518	15%	95%	\$1.75	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	148	25	\$1,518	15%	95%	\$1.04	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	148	25	\$1,518	15%	95%	\$1.04	0.00
Electric	Small Retail	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	790	25	\$12,099	10%	45%	\$1.56	0.00
Electric	Small Retail	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	619	7	\$1,032	90%	95%	\$0.37	0.00
Electric	Small Retail	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	495	3	\$1,256	95%	50%	\$1.16	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	302	10	\$1,292	35%	70%	\$0.73	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	302	10	\$1,292	35%	70%	\$0.73	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	509	10	\$1,292	35%	70%	\$0.43	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	509	10	\$1,292	35%	70%	\$0.43	0.00
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	271	25	\$13	15%	90%	\$0.01	0.00
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	271	25	\$13	15%	90%	\$0.01	40,172
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	311	25	\$205	15%	25%	\$0.07	0.00
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	311	25	\$205	15%	25%	\$0.07	10,006
Electric	Small Retail	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	195	15	\$2,122	100%	N/A	\$1.42	0.00
Electric	Small Retail	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	398	15	\$4,245	100%	N/A	\$1.39	15
Electric	Small Retail	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	398	15	\$4,245	100%	N/A	\$1.39	0.00
Electric	Small Retail	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	150	7	\$3,874	95%	95%	\$5.72	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	190	15	\$1,832	80%	95%	\$1.26	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	190	15	\$1,832	80%	95%	\$1.26	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	277	15	\$1,832	80%	95%	\$0.86	0.00
Electric	Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	277	15	\$1,832	80%	95%	\$0.86	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	270	14	\$9,005	5.0%	95%	\$4.54	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	270	14	\$9,005	5.0%	95%	\$4.54	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	400	14	\$9,005	5.0%	95%	\$3.06	0.00
Electric	Small Retail	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	400	14	\$9,005	5.0%	95%	\$3.06	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	190	40	\$53,039	2.0%	100%	\$24.69	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	190	40	\$53,039	2.0%	100%	\$24.69	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	277	40	\$53,039	2.0%	100%	\$16.96	0.00
Electric	Small Retail	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	277	40	\$53,039	2.0%	100%	\$16.96	0.00
Electric	Small Retail	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	1,426	30	\$80,804	5.0%	N/A	\$5.22	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	45	25	\$1,326	75%	85%	\$2.96	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	45	25	\$1,326	75%	85%	\$2.96	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	66	25	\$1,326	75%	85%	\$2.02	0.00
Electric	Small Retail	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	66	25	\$1,326	75%	85%	\$2.02	0.00
Electric	Small Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	82	20	\$82	45%	85%	\$0.11	2,682
Electric	Small Retail	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	82	20	\$91	45%	85%	\$0.12	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	81	25	\$1,518	15%	95%	\$1.90	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	81	25	\$1,518	15%	95%	\$1.90	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	137	25	\$1,518	15%	95%	\$1.12	0.00
Electric	Small Retail	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	137	25	\$1,518	15%	95%	\$1.12	0.00
Electric	Small Retail	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	67	25	\$1,265	95%	85%	\$1.91	0.00
Electric	Small Retail	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	67	25	\$1,265	95%	85%	\$1.91	4,697
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	302	10	\$1,292	0.0%	0%	\$0.73	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	302	10	\$1,292	0.0%	0%	\$0.73	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	509	10	\$1,292	0.0%	0%	\$0.43	0.00
Electric	Small Retail	Heat Pump	Window Film	Window Film	No Film	Per Building	New	509	10	\$1,292	0.0%	0%	\$0.43	0.00
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	250	25	\$13	80%	90%	\$0.01	0.00
Electric	Small Retail	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	250	25	\$13	80%	90%	\$0.01	20,479
Electric	Small Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	1,259	8	\$492	75%	70%	\$0.08	0.00
Electric	Small Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,046	15	\$728	62%	90%	\$0.09	0.00
Electric	Small Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	1,046	15	\$810	62%	90%	\$0.10	0.00
Electric	Small Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	528	8	\$493	45%	90%	\$0.19	0.00
Electric	Small Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	528	8	\$548	45%	90%	\$0.21	0.00
Electric	Small Retail	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	953	17	\$648	75%	50%	\$0.08	0.00
Electric	Small Retail	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	435	8	\$61	25%	25%	\$0.03	282,950
Electric	Small Retail	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	435	8	\$68	25%	25%	\$0.03	267,530
Electric	Small Retail	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	1,259	8	\$492	75%	70%	\$0.08	0.00
Electric	Small Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,046	15	\$728	62%	90%	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	1,046	15	\$810	62%	90%	\$0.10	0.00
Electric	Small Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	528	8	\$493	45%	90%	\$0.19	0.00
Electric	Small Retail	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	528	8	\$548	45%	90%	\$0.21	0.00
Electric	Small Retail	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	953	17	\$648	75%	50%	\$0.08	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	642	10	\$224	0.5%	75%	\$0.06	22,514
Electric	Small Retail	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	Existing	642	10	\$249	0.5%	75%	\$0.07	20,979
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	6,808	8	\$5,236	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	6,808	8	\$5,236	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,176	8	\$5,236	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	7,176	8	\$5,236	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,106	8	\$3,927	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,106	8	\$3,927	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,382	8	\$3,927	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	5,382	8	\$3,927	30%	85%	\$0.15	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	423	6	\$157	2.5%	80%	\$0.06	74,032
Electric	Small Retail	Lighting Interior Fluorescent	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	Existing	423	6	\$157	2.5%	80%	\$0.06	79,427
Electric	Small Retail	Lighting Interior Fluorescent	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	Existing	317	6	\$161	2.5%	80%	\$0.11	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,324	13	\$21,281	50%	N/A	\$0.71	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,324	13	\$21,281	50%	N/A	\$0.71	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,386	13	\$21,796	50%	N/A	\$0.72	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	4,386	13	\$21,796	50%	N/A	\$0.72	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	968	13	\$385	100%	N/A	\$0.09	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	968	13	\$385	100%	N/A	\$0.09	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	982	13	\$379	100%	N/A	\$0.09	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	982	13	\$379	100%	N/A	\$0.09	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,805	13	\$3,068	100%	N/A	\$0.28	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,805	13	\$3,068	100%	N/A	\$0.28	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,013	13	\$3,052	100%	N/A	\$0.25	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,013	13	\$3,052	100%	N/A	\$0.25	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,779	13	\$1,316	100%	N/A	\$0.09	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,779	13	\$1,316	100%	N/A	\$0.09	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,042	13	\$1,329	100%	N/A	\$0.08	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	2,042	13	\$1,329	100%	N/A	\$0.08	0.00
Electric	Small Retail	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,925	8	\$493	5.0%	90%	\$0.03	1,234,354
Electric	Small Retail	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	2,925	8	\$548	5.0%	90%	\$0.04	1,150,502
Electric	Small Retail	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,411	8	\$61	5.0%	25%	\$0.01	339,904
Electric	Small Retail	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	2,411	8	\$68	5.0%	25%	\$0.01	316,813
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,021	15	\$430	100%	N/A	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,334	15	\$1,779	95%	N/A	\$0.17	0.00
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,130	16	\$13,111	50%	N/A	\$1.42	0.00
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	687	11	\$13	25%	N/A	-\$0.03	283,513
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	687	11	\$13	25%	N/A	-\$0.03	289,359
Electric	Small Retail	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	309	15	\$8,292	100%	N/A	\$3.35	0.00
Electric	Small Retail	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	515	8	\$493	5.0%	90%	\$0.19	0.00
Electric	Small Retail	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	515	8	\$548	5.0%	90%	\$0.21	0.00
Electric	Small Retail	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	424	8	\$61	10%	25%	\$0.03	114,352
Electric	Small Retail	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	424	8	\$68	10%	25%	\$0.03	108,128
Electric	Small Retail	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	356	11	\$138	95%	65%	\$0.06	2,284,839
Electric	Small Retail	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	356	11	\$138	95%	65%	\$0.06	2,284,839
Electric	Small Retail	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	395	11	\$153	95%	65%	\$0.06	2,400,528
Electric	Small Retail	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	395	11	\$153	95%	65%	\$0.06	2,400,528
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	71	13	\$60	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	71	13	\$60	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	79	13	\$68	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	79	13	\$68	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	734	10	\$224	0.5%	75%	\$0.05	2,973
Electric	Small Retail	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	734	10	\$249	0.5%	75%	\$0.06	3,612
Electric	Small Retail	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,415	8	\$5,236	30%	85%	\$0.19	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,415	8	\$5,236	30%	85%	\$0.19	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,708	8	\$5,236	30%	85%	\$0.18	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	5,708	8	\$5,236	30%	85%	\$0.18	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,061	8	\$3,927	30%	85%	\$0.19	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,061	8	\$3,927	30%	85%	\$0.19	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,281	8	\$3,927	30%	85%	\$0.18	0.00
Electric	Small Retail	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	4,281	8	\$3,927	30%	85%	\$0.18	0.00
Electric	Small Retail	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	327	6	\$80	2.5%	80%	\$0.02	7,105
Electric	Small Retail	Lighting Interior Other	Display Case LEDs	Display Case LEDs	Standard Case Lighting	Per Building	New	327	6	\$80	2.5%	80%	\$0.02	8,631
Electric	Small Retail	Lighting Interior Other	Display Case LEDs (Open Cases)	Display Case LEDs (Open Cases)	Standard Case Lighting	Per Building	New	180	6	\$70	2.5%	80%	\$0.08	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	71	13	\$60	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	71	13	\$60	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	79	13	\$68	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	79	13	\$68	95%	95%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,936	13	\$12,591	100%	N/A	\$0.61	0.00
Electric	Small Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,936	13	\$12,591	100%	N/A	\$0.61	0.00
Electric	Small Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	5,505	13	\$9,689	100%	N/A	\$0.25	0.00
Electric	Small Retail	Lighting Interior Other	Lighting Package - High Efficiency	15% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	5,505	13	\$9,689	100%	N/A	\$0.25	0.00
Electric	Small Retail	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	3,339	8	\$493	5.0%	90%	\$0.03	163,025
Electric	Small Retail	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	3,339	8	\$548	5.0%	90%	\$0.03	198,029
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	6,767	4	\$39	85%	N/A	\$-0.02	0.00
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	18,882	4	\$111	85%	N/A	\$-0.02	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,657	1	\$12	100%	N/A	\$0.01	0.00
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	15,786	1	\$34	100%	N/A	\$0.01	0.00
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	6,818	12	\$1,013	85%	N/A	\$0.01	6,230,366
Electric	Small Retail	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	19,025	12	\$2,827	85%	N/A	\$0.01	17,040,401
Electric	Small Retail	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	807	8	\$493	5.0%	90%	\$0.12	0.00
Electric	Small Retail	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor Control	Per Building	Existing	807	8	\$548	5.0%	90%	\$0.14	0.00
Electric	Small Retail	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	665	8	\$61	1.0%	25%	\$0.02	4,118
Electric	Small Retail	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	665	8	\$68	1.0%	25%	\$0.02	10,865
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.52	10%	90%	\$0.05	1,931
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.52	10%	90%	\$0.05	1,931
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.52	10%	90%	\$0.05	2,314
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	2	7	\$0.52	10%	90%	\$0.05	2,314
Electric	Small Retail	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	24	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Small Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	30	10	\$0.00	95%	75%	\$0.00	249,735
Electric	Small Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	30	10	\$0.00	95%	75%	\$0.00	270,385
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	60	4	\$12	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	60	4	\$12	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.52	10%	90%	\$0.05	258
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.52	10%	90%	\$0.05	258
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.52	10%	90%	\$0.05	241

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	2	7	\$0.52	10%	90%	\$0.05	241
Electric	Small Retail	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	24	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Small Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	30	10	\$0.00	95%	75%	\$0.00	28,210
Electric	Small Retail	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	30	10	\$0.00	95%	75%	\$0.00	33,477
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	54	4	\$10	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	60	4	\$12	60%	90%	\$0.07	0.00
Electric	Small Retail	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	60	4	\$12	60%	90%	\$0.07	0.00
Electric	Small Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	43	6	\$53	100%	N/A	\$0.31	0.00
Electric	Small Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	43	6	\$53	100%	N/A	\$0.31	13
Electric	Small Retail	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	43	6	\$53	100%	N/A	\$0.31	20
Electric	Small Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	72	6	\$10	100%	N/A	\$0.04	5,352
Electric	Small Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	72	6	\$10	100%	N/A	\$0.04	9,634
Electric	Small Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	72	6	\$10	100%	N/A	\$0.04	0.00
Electric	Small Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	112	20	\$306	100%	N/A	\$0.31	0.00
Electric	Small Retail	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	126	20	\$410	100%	N/A	\$0.37	0.00
Electric	Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	98	20	\$24	100%	N/A	\$0.03	98,252
Electric	Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	98	20	\$24	100%	N/A	\$0.03	106,050
Electric	Small Retail	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	31	20	\$10	100%	N/A	\$0.04	0.00
Electric	Small Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	770	20	\$81	8.8%	100%	\$0.01	510,139
Electric	Small Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	770	20	\$81	8.8%	100%	\$0.01	510,139
Electric	Small Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	786	20	\$79	8.8%	100%	\$0.01	563,582
Electric	Small Retail	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	786	20	\$79	8.8%	100%	\$0.01	563,582
Electric	Small Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	112	20	\$306	100%	N/A	\$0.31	0.00
Electric	Small Retail	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	126	20	\$410	100%	N/A	\$0.37	0.00
Electric	Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	98	20	\$24	100%	N/A	\$0.03	45,384
Electric	Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	98	20	\$24	100%	N/A	\$0.03	46,296
Electric	Small Retail	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	31	20	\$10	100%	N/A	\$0.04	0.00
Electric	Small Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	191	15	\$1,832	80%	95%	\$1.25	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	243	15	\$1,832	80%	95%	\$0.98	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	350	15	\$18,480	2.5%	65%	\$6.89	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	446	15	\$18,480	2.5%	65%	\$5.41	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	350	15	\$15,264	2.5%	65%	\$5.69	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	446	15	\$15,264	2.5%	65%	\$4.47	0.00
Electric	Small Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	191	40	\$53,039	2.0%	100%	\$24.62	0.00
Electric	Small Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	243	40	\$53,039	2.0%	100%	\$19.33	0.00
Electric	Small Retail	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	95	12	\$146	10%	60%	\$0.23	11,502
Electric	Small Retail	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	121	12	\$146	10%	60%	\$0.18	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	7	25	\$2,757	45%	65%	\$38.03	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9	25	\$2,757	45%	65%	\$29.87	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.66	25	\$1,326	25%	85%	\$203.32	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.84	25	\$1,326	25%	85%	\$159.69	0.00
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	178	9	\$49	100%	N/A	\$0.05	42,242
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	178	9	\$49	100%	N/A	\$0.05	42,242
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	227	9	\$49	100%	N/A	\$0.04	66,105
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	227	9	\$49	100%	N/A	\$0.04	66,105
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	241	25	\$13	15%	90%	\$0.01	84,099
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	307	25	\$13	15%	90%	\$0.00	45,312
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	220	25	\$205	15%	25%	\$0.09	16,496
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	280	25	\$205	15%	25%	\$0.07	8,915
Electric	Small Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	191	15	\$1,832	80%	95%	\$1.25	0.00
Electric	Small Retail	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	243	15	\$1,832	80%	95%	\$0.98	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	350	15	\$14,784	2.5%	65%	\$5.51	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	446	15	\$14,784	2.5%	65%	\$4.33	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	350	15	\$12,211	2.5%	65%	\$4.55	0.00
Electric	Small Retail	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	446	15	\$12,211	2.5%	65%	\$3.58	0.00
Electric	Small Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	191	40	\$53,039	2.0%	100%	\$24.62	0.00
Electric	Small Retail	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	243	40	\$53,039	2.0%	100%	\$19.33	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.66	25	\$1,326	75%	85%	\$203.32	0.00
Electric	Small Retail	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.84	25	\$1,326	75%	85%	\$159.69	0.00
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	178	9	\$49	100%	N/A	\$0.05	14,507
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	178	9	\$49	100%	N/A	\$0.05	14,507
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	227	9	\$49	100%	N/A	\$0.04	15,263
Electric	Small Retail	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	227	9	\$49	100%	N/A	\$0.04	15,263
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	241	25	\$13	80%	90%	\$0.01	44,581
Electric	Small Retail	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	307	25	\$13	80%	90%	\$0.00	28,083
Electric	Small Retail	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	419	15	\$15,271	2.5%	65%	\$4.76	0.00
Electric	Small Retail	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	67	12	\$146	10%	60%	\$0.33	0.00
Electric	Small Retail	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	132	25	\$2,757	45%	65%	\$2.11	0.00
Electric	Small Retail	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	16	25	\$1,326	25%	85%	\$8.02	0.00
Electric	Small Retail	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	162	25	\$4,921	15%	85%	\$3.08	0.00
Electric	Small Retail	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	30	25	\$1,518	15%	95%	\$5.11	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	81	25	\$12,099	10%	45%	\$15.05	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	81	25	\$12,099	10%	45%	\$15.05	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	214	25	\$12,099	10%	45%	\$5.74	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	214	25	\$12,099	10%	45%	\$5.74	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	419	15	\$10,472	2.5%	65%	\$3.26	0.00
Electric	Small Retail	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	16	25	\$1,326	75%	85%	\$8.02	0.00
Electric	Small Retail	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	30	25	\$1,518	15%	95%	\$5.11	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	81	25	\$1,265	95%	85%	\$1.57	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	81	25	\$1,265	95%	85%	\$1.57	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	214	25	\$1,265	95%	85%	\$0.60	0.00
Electric	Small Retail	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	214	25	\$1,265	95%	85%	\$0.60	0.00
Electric	Small Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	30	9	\$4	100%	N/A	\$0.02	180,312
Electric	Small Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	30	9	\$4	100%	N/A	\$0.02	182,589
Electric	Small Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	30	9	\$4	100%	N/A	\$0.02	23,395
Electric	Small Retail	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	30	9	\$4	100%	N/A	\$0.02	27,331
Electric	Small Retail	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	26	18	\$1,256	45%	85%	\$5.59	0.00
Electric	Small Retail	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	159	14	\$9,005	5.0%	95%	\$7.69	0.00
Electric	Small Retail	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	106	12	\$146	10%	60%	\$0.21	0.00
Electric	Small Retail	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	209	25	\$2,757	45%	65%	\$1.34	0.00
Electric	Small Retail	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	26	25	\$1,326	25%	85%	\$5.10	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	31	20	\$469	45%	60%	\$1.65	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	31	20	\$522	45%	60%	\$1.84	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	19	20	\$82	45%	85%	\$0.49	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	19	20	\$91	45%	85%	\$0.53	0.00
Electric	Small Retail	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	255	25	\$4,921	15%	85%	\$1.96	0.00
Electric	Small Retail	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	47	25	\$1,518	15%	95%	\$3.25	0.00
Electric	Small Retail	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	338	25	\$12,099	10%	45%	\$3.65	0.00
Electric	Small Retail	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	132	7	\$1,032	90%	95%	\$1.72	0.00
Electric	Small Retail	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	34	7	\$3,874	95%	95%	\$24.64	0.00
Electric	Small Retail	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	159	14	\$9,005	5.0%	95%	\$7.69	0.00
Electric	Small Retail	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	26	25	\$1,326	75%	85%	\$5.10	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	19	20	\$82	45%	85%	\$0.49	0.00
Electric	Small Retail	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	19	20	\$91	45%	85%	\$0.53	0.00
Electric	Small Retail	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	47	25	\$1,518	15%	95%	\$3.25	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	128	25	\$1,265	95%	85%	\$1.00	0.00
Electric	Small Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	523	10	\$71	100%	N/A	\$0.02	1,646,547
Electric	Small Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	523	10	\$71	100%	N/A	\$0.02	1,708,899
Electric	Small Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	523	10	\$71	100%	N/A	\$0.02	300,446
Electric	Small Retail	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	523	10	\$71	100%	N/A	\$0.02	350,197
Electric	Small Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	17	15	\$34	95%	90%	\$0.26	0.00
Electric	Small Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	427	20	\$582	55%	65%	\$0.15	0.00
Electric	Small Retail	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	92	7	\$26	65%	25%	\$0.06	0.00
Electric	Small Retail	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	17	15	\$34	95%	90%	\$0.26	0.00
Electric	Small Retail	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	427	20	\$582	55%	45%	\$0.15	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	37	9	\$14	25%	95%	\$0.07	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$5	5.0%	95%	\$0.04	323
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$5	5.0%	95%	\$0.04	343
Electric	Small Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	16	10	\$1,454	75%	95%	\$14.90	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	14	12	\$39	10%	35%	\$0.42	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	3	12	\$25	75%	75%	\$1.16	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	66	25	\$800	2.5%	95%	\$1.23	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	12	9	\$0.00	95%	75%	\$0.00	6,642
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	12	9	\$0.00	95%	75%	\$0.00	7,058
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	50%	\$0.00	1,823
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	50%	\$0.00	1,937
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$7	95%	25%	\$0.67	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$7	95%	25%	\$0.72	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	8	10	\$105	75%	85%	\$2.17	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	8	10	\$117	75%	85%	\$2.41	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	198	15	\$241	75%	N/A	\$0.21	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	195	15	\$144	75%	N/A	\$0.15	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	37	9	\$14	25%	95%	\$0.07	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$5	5.0%	95%	\$0.04	25
Electric	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$5	5.0%	95%	\$0.04	32
Electric	Small Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	16	10	\$1,454	75%	95%	\$15.02	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	14	12	\$39	10%	35%	\$0.42	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	65	25	\$639	2.5%	95%	\$0.99	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	12	9	\$0.00	95%	75%	\$0.00	535
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	12	9	\$0.00	95%	75%	\$0.00	669
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	50%	\$0.00	147
Electric	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	50%	\$0.00	183
Electric	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	8	10	\$105	75%	85%	\$2.18	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	8	10	\$117	75%	85%	\$2.43	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	198	15	\$241	75%	N/A	\$0.21	0.00
Electric	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	195	15	\$144	75%	N/A	\$0.15	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	37	9	\$14	25%	95%	\$0.07	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$5	5.0%	95%	\$0.04	2,636
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	17	14	\$5	5.0%	95%	\$0.04	2,801
Electric	Small Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	17	10	\$1,454	25%	95%	\$14.25	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	14	12	\$39	75%	35%	\$0.42	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	3	12	\$25	75%	75%	\$1.11	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	69	25	\$800	2.5%	95%	\$1.18	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.00	95%	75%	\$0.00	56,627
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	13	9	\$0.00	95%	75%	\$0.00	60,172
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	50%	\$0.00	15,544
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	50%	\$0.00	16,517
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	2	9	\$7	95%	25%	\$0.65	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	2	9	\$7	95%	25%	\$0.69	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	8	10	\$105	75%	85%	\$2.07	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	8	10	\$117	75%	85%	\$2.31	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	183	15	\$1,241	75%	N/A	\$0.99	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	10	15	\$53	100%	N/A	\$0.66	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	37	9	\$14	25%	95%	\$0.07	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$5	5.0%	95%	\$0.04	277
Electric	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	17	14	\$5	5.0%	95%	\$0.04	343
Electric	Small Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	16	10	\$1,454	25%	95%	\$14.69	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	14	12	\$39	75%	35%	\$0.42	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	67	25	\$639	2.5%	95%	\$0.97	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	12	9	\$0.00	95%	75%	\$0.00	5,861
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	12	9	\$0.00	95%	75%	\$0.00	7,225
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	50%	\$0.00	1,609
Electric	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	50%	\$0.00	1,983
Electric	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	8	10	\$105	75%	85%	\$2.14	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	8	10	\$117	75%	85%	\$2.38	0.00
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	183	15	\$1,241	75%	N/A	\$0.99	14
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	183	15	\$1,241	75%	N/A	\$0.99	33
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	10	15	\$53	100%	N/A	\$0.66	-2.773416
Electric	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	10	15	\$53	100%	N/A	\$0.66	-25.340052
Electric	Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	99	4	\$11	100%	N/A	\$0.04	195,546
Electric	Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	Existing	99	4	\$11	100%	N/A	\$0.04	209,114
Electric	Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	99	4	\$11	100%	N/A	\$0.04	57,455
Electric	Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building	New	99	4	\$11	100%	N/A	\$0.04	65,337
Electric	Warehouse	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	Existing	162	10	\$3,945	25%	95%	\$4.12	0.00
Electric	Warehouse	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	Existing	107	10	\$4,557	75%	95%	\$7.20	0.00
Electric	Warehouse	Cooling Chillers	Chilled Water Side Economizer	Install Economizer	No Economizer	Per Building	Existing	107	15	\$9,161	45%	90%	\$11.14	0.00
Electric	Warehouse	Cooling Chillers	Chiller - Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	297	15	\$687	90%	90%	\$0.30	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	Existing	178	15	\$321	75%	90%	\$0.24	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	451	20	\$2,938	100%	N/A	\$0.73	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	150	20	\$979	100%	N/A	\$0.73	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	Existing	335	20	\$2,184	100%	N/A	\$0.73	0.00
Electric	Warehouse	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	215	15	\$2,341	80%	95%	\$1.42	0.00
Electric	Warehouse	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	Existing	172	7	\$488	10%	95%	\$0.63	0.00
Electric	Warehouse	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	301	15	\$43	65%	35%	\$0.02	0.00
Electric	Warehouse	Cooling Chillers	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	301	15	\$43	65%	35%	\$0.02	140,182
Electric	Warehouse	Cooling Chillers	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Building	Existing	86	13	\$353	75%	75%	\$0.59	0.00
Electric	Warehouse	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	215	40	\$67,768	2.0%	100%	\$27.97	0.00
Electric	Warehouse	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	107	12	\$47	10%	60%	\$0.07	0.00
Electric	Warehouse	Cooling Chillers	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	107	12	\$47	10%	60%	\$0.07	10,504
Electric	Warehouse	Cooling Chillers	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8	25	\$3,523	45%	65%	\$44.78	0.00
Electric	Warehouse	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.74	25	\$1,694	25%	85%	\$231.04	0.00
Electric	Warehouse	Cooling Chillers	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	268	7	\$1,318	90%	95%	\$1.09	0.00
Electric	Warehouse	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	215	3	\$0.00	95%	20%	\$0.00	0.00
Electric	Warehouse	Cooling Chillers	Tune-up - Chiller Maintenance	Chiller Tune-up	Unmaintained Chiller	Per Building	Existing	215	3	\$0.00	95%	20%	\$0.00	106,216
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	118	10	\$416	35%	70%	\$0.60	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	118	10	\$416	35%	70%	\$0.60	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	188	10	\$416	35%	70%	\$0.37	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	Existing	188	10	\$416	35%	70%	\$0.37	0.00
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	271	25	\$4	15%	90%	\$0.00	0.00
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	271	25	\$4	15%	90%	\$0.00	79,675
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	247	25	\$65	15%	25%	\$0.03	0.00
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	247	25	\$65	15%	25%	\$0.03	15,176
Electric	Warehouse	Cooling Chillers	Chilled Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only with Constant Speed Pump	Per Building	New	134	10	\$3,551	25%	95%	\$4.48	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Cooling Chillers	Chilled Water Reset	Chilled Water Temperature Reset	Constant Chilled Water Temperature	Per Building	New	89	10	\$4,557	0.0%	0%	\$8.70	0.00
Electric	Warehouse	Cooling Chillers	Chiller - Pipe Insulation	2.0" of Insulation, assuming R-8	1.0" of Insulation, assuming R-4 (KY State Code)	Per Building	New	178	15	\$321	95%	90%	\$0.24	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - Advanced Efficiency	Advanced Efficiency - 0.58 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	451	20	\$2,645	100%	N/A	\$0.66	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - High Efficiency	High Efficiency - 0.71 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	150	20	\$881	100%	N/A	\$0.66	0.00
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	335	20	\$1,966	100%	N/A	\$0.66	1
Electric	Warehouse	Cooling Chillers	Chillers < 150 tons (screw) - Premium Efficiency	Premium Efficiency - 0.63 kW/ton (full load)	Standard Efficiency - 0.775 kW/ton (full load)	Per Building	New	335	20	\$1,966	100%	N/A	\$0.66	0.00
Electric	Warehouse	Cooling Chillers	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	58	7	\$4,950	95%	95%	\$18.79	0.00
Electric	Warehouse	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	178	15	\$2,341	80%	95%	\$1.72	0.00
Electric	Warehouse	Cooling Chillers	Cooling Tower-Decrease Approach Temperature	6 Deg F	10 Deg F	Per Building	New	142	7	\$438	10%	95%	\$0.68	0.00
Electric	Warehouse	Cooling Chillers	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	178	40	\$67,768	2.0%	100%	\$33.78	0.00
Electric	Warehouse	Cooling Chillers	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.61	25	\$1,694	75%	85%	\$278.99	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	118	10	\$416	0.0%	0%	\$0.60	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	118	10	\$416	0.0%	0%	\$0.60	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	188	10	\$416	0.0%	0%	\$0.37	0.00
Electric	Warehouse	Cooling Chillers	Window Film	Window Film	No Film	Per Building	New	188	10	\$416	0.0%	0%	\$0.37	0.00
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	224	25	\$4	80%	90%	\$0.00	0.00
Electric	Warehouse	Cooling Chillers	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	224	25	\$4	80%	90%	\$0.00	46,012
Electric	Warehouse	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	226	15	\$2,341	80%	95%	\$1.35	0.00
Electric	Warehouse	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	238	15	\$2,341	80%	95%	\$1.28	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	64	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	165	15	\$454	100%	N/A	\$0.36	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	339	10	\$2,844	10%	40%	\$1.42	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package-Air Side Economizer	Air-Side Economizer	No Economizer	Per Building	Existing	357	10	\$2,844	10%	40%	\$1.35	0.00
Electric	Warehouse	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	56	18	\$1,605	45%	85%	\$3.36	0.00
Electric	Warehouse	Cooling Dx Evap	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	59	18	\$1,605	45%	85%	\$3.18	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	1,368	15	\$-9535.926	35%	N/A	\$-1.17	880,018
Electric	Warehouse	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	Existing	1,368	15	\$-9535.926	35%	N/A	\$-1.17	1,730,069
Electric	Warehouse	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	226	40	\$67,768	2.0%	100%	\$26.58	0.00
Electric	Warehouse	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	238	40	\$67,768	2.0%	100%	\$25.21	0.00
Electric	Warehouse	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	113	12	\$47	10%	60%	\$0.06	49,494
Electric	Warehouse	Cooling Dx Evap	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	119	12	\$47	10%	60%	\$0.06	26,049
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8	25	\$3,523	45%	65%	\$42.54	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	8	25	\$3,523	45%	65%	\$40.36	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.78	25	\$1,694	25%	85%	\$219.51	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.82	25	\$1,694	25%	85%	\$208.24	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	67	20	\$1,739	45%	60%	\$2.87	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	71	20	\$1,739	45%	60%	\$2.73	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	40	20	\$305	45%	85%	\$0.84	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	42	20	\$305	45%	85%	\$0.80	0.00
Electric	Warehouse	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	282	7	\$1,318	90%	95%	\$1.03	0.00
Electric	Warehouse	Cooling Dx Evap	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	298	7	\$1,318	90%	95%	\$0.98	0.00
Electric	Warehouse	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	226	5	\$802	95%	50%	\$1.03	0.00
Electric	Warehouse	Cooling Dx Evap	Tune-up - DX Maintenance	DX Tune-up / Diagnostics	No DX Tune-Up / Diagnostics	Per Building	Existing	238	5	\$802	95%	50%	\$0.98	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	118	10	\$416	35%	70%	\$0.60	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	118	10	\$416	35%	70%	\$0.60	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	188	10	\$416	35%	70%	\$0.37	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	Existing	188	10	\$416	35%	70%	\$0.37	0.00
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	285	25	\$4	15%	90%	\$0.00	363,453
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	301	25	\$4	15%	90%	\$0.00	191,287
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	260	25	\$65	15%	25%	\$0.03	71,508
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	274	25	\$65	15%	25%	\$0.02	37,635
Electric	Warehouse	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	68	7	\$4,950	95%	95%	\$15.97	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Cooling Dx Evap	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	72	7	\$4,950	95%	95%	\$15.21	0.00
Electric	Warehouse	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	209	15	\$2,341	80%	95%	\$1.46	0.00
Electric	Warehouse	Cooling Dx Evap	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	220	15	\$2,341	80%	95%	\$1.39	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER	Standard Efficiency - 11.2 EER	Per Building	New	64	15	\$0.00	100%	N/A	\$0.00	0.00
Electric	Warehouse	Cooling Dx Evap	DX Package 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	165	15	\$363	100%	N/A	\$0.29	0.00
Electric	Warehouse	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	1,368	15	-\$6952.248	35%	N/A	-\$0.87	150,357
Electric	Warehouse	Cooling Dx Evap	Evaporative Cooler Replaces DX Package 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 25.0 EER	Standard Efficiency - 11.2 EER	Per Building	New	1,368	15	-\$6952.248	35%	N/A	-\$0.87	291,753
Electric	Warehouse	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	209	40	\$67,768	2.0%	100%	\$28.70	0.00
Electric	Warehouse	Cooling Dx Evap	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	220	40	\$67,768	2.0%	100%	\$27.33	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.72	25	\$1,694	75%	85%	\$237.02	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.76	25	\$1,694	75%	85%	\$225.75	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	37	20	\$305	45%	85%	\$0.91	0.00
Electric	Warehouse	Cooling Dx Evap	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	39	20	\$305	45%	85%	\$0.86	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	118	10	\$416	0.0%	0%	\$0.60	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	118	10	\$416	0.0%	0%	\$0.60	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	188	10	\$416	0.0%	0%	\$0.37	0.00
Electric	Warehouse	Cooling Dx Evap	Window Film	Window Film	No Film	Per Building	New	188	10	\$416	0.0%	0%	\$0.37	0.00
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	264	25	\$4	80%	90%	\$0.00	131,995
Electric	Warehouse	Cooling Dx Evap	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	277	25	\$4	80%	90%	\$0.00	69,707
Electric	Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	4	6	\$0.00	100%	N/A	\$0.00	80,448
Electric	Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	Existing	4	6	\$0.00	100%	N/A	\$0.00	83,344
Electric	Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	4	6	\$0.00	100%	N/A	\$0.00	12,436
Electric	Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building	New	4	6	\$0.00	100%	N/A	\$0.00	14,314
Electric	Warehouse	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	Existing	13	4	\$14	100%	N/A	\$0.39	0.00
Electric	Warehouse	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	13	4	\$14	100%	N/A	\$0.39	6
Electric	Warehouse	Flat Screen Monitors	Monitor - ENERGY STAR	ENERGY STAR Monitor	Standard Monitor	Per Building	New	13	4	\$14	100%	N/A	\$0.39	9
Electric	Warehouse	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	Existing	0.97	20	\$0.66	100%	N/A	\$0.08	0.00

Table F.2. Commercial Electric Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	2	20	\$0.66	100%	N/A	\$0.03	13,500
Electric	Warehouse	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	Existing	2	20	\$0.66	100%	N/A	\$0.03	-241.610436
Electric	Warehouse	Freezers	Recycling Existing Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	18	20	\$2	8.8%	100%	\$0.02	34,362
Electric	Warehouse	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	18	20	\$2	8.8%	100%	\$0.02	34,362
Electric	Warehouse	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	21	20	\$2	8.8%	100%	\$0.01	36,838
Electric	Warehouse	Freezers	Residential Freezer Recycling	Recycling Existing Freezer	Existing Freezer	Per Building	Existing	21	20	\$2	8.8%	100%	\$0.01	36,838
Electric	Warehouse	Freezers	Freezer (Residential) - ENERGY STAR	ENERGY STAR Freezer	Federal Standard 2001 Freezer	Per Building	New	0.97	20	\$0.66	100%	N/A	\$0.08	0.00
Electric	Warehouse	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	2	20	\$0.66	100%	N/A	\$0.03	4,684
Electric	Warehouse	Freezers	Freezer (Residential) - Federal Standard 2015	Federal Standard 2015 Freezer	Federal Standard 2001 Freezer	Per Building	New	2	20	\$0.66	100%	N/A	\$0.03	-31.372188
Electric	Warehouse	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	118	15	\$1,695	100%	N/A	\$1.87	0.00
Electric	Warehouse	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	249	15	\$3,390	100%	N/A	\$1.78	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	65	15	\$2,341	80%	95%	\$4.66	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	65	15	\$2,341	80%	95%	\$4.66	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	124	15	\$2,341	80%	95%	\$2.47	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	124	15	\$2,341	80%	95%	\$2.47	0.00
Electric	Warehouse	Heat Pump	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	76	18	\$1,605	45%	85%	\$2.49	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	270	14	\$6,067	5.0%	95%	\$3.05	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	270	14	\$6,067	5.0%	95%	\$3.05	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	358	14	\$6,067	5.0%	95%	\$2.31	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	358	14	\$6,067	5.0%	95%	\$2.31	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	65	40	\$67,768	2.0%	100%	\$91.49	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	65	40	\$67,768	2.0%	100%	\$91.49	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	124	40	\$67,768	2.0%	100%	\$48.48	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	124	40	\$67,768	2.0%	100%	\$48.48	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	Existing	862	30	\$494	5.0%	N/A	\$10.88	0.00
Electric	Warehouse	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	228	12	\$47	10%	60%	\$0.03	11,593
Electric	Warehouse	Heat Pump	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	228	12	\$47	10%	60%	\$0.03	29,816
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	343	25	\$3,523	45%	65%	\$1.05	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	343	25	\$3,523	45%	65%	\$1.05	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	450	25	\$3,523	45%	65%	\$0.80	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	450	25	\$3,523	45%	65%	\$0.80	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	45	25	\$1,694	25%	85%	\$3.82	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	45	25	\$1,694	25%	85%	\$3.82	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	59	25	\$1,694	25%	85%	\$2.90	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	59	25	\$1,694	25%	85%	\$2.90	0.00
Electric	Warehouse	Heat Pump	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	91	20	\$1,739	45%	60%	\$2.14	0.00
Electric	Warehouse	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	54	20	\$305	45%	85%	\$0.62	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	662	25	\$6,288	15%	85%	\$0.97	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	662	25	\$6,288	15%	85%	\$0.97	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	938	25	\$6,288	15%	85%	\$0.68	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	938	25	\$6,288	15%	85%	\$0.68	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	93	25	\$1,940	15%	95%	\$2.12	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	93	25	\$1,940	15%	95%	\$2.12	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	130	25	\$1,940	15%	95%	\$1.51	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	130	25	\$1,940	15%	95%	\$1.51	0.00
Electric	Warehouse	Heat Pump	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	485	25	\$15,459	10%	45%	\$3.24	0.00
Electric	Warehouse	Heat Pump	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	380	7	\$1,318	90%	95%	\$0.77	0.00
Electric	Warehouse	Heat Pump	Tune-up - Heat Pump Maintenance	Heat Pump Maintenance (Tune-up)	Unmaintained Heat Pump	Per Building	Existing	304	3	\$802	95%	50%	\$1.20	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	25	10	\$416	35%	70%	\$2.76	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	25	10	\$416	35%	70%	\$2.76	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	76	10	\$416	35%	70%	\$0.92	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	Existing	76	10	\$416	35%	70%	\$0.92	0.00
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	80	25	\$4	15%	90%	\$0.01	11,612
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	80	25	\$4	15%	90%	\$0.01	29,866

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	128	25	\$65	15%	25%	\$0.05	4,047
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	128	25	\$65	15%	25%	\$0.05	10,409
Electric	Warehouse	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - High Efficiency	High Efficiency - 11.5 EER, 3.4 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	118	15	\$1,356	100%	N/A	\$1.50	0.00
Electric	Warehouse	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	249	15	\$2,712	100%	N/A	\$1.42	18
Electric	Warehouse	Heat Pump	Air Source Heat Pump 65 to 135 kBtuh - Premium Efficiency	Premium Efficiency - 12.0 EER, 3.8 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	249	15	\$2,712	100%	N/A	\$1.42	26
Electric	Warehouse	Heat Pump	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	92	7	\$4,950	95%	95%	\$11.90	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	60	15	\$2,341	80%	95%	\$5.04	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	60	15	\$2,341	80%	95%	\$5.04	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	114	15	\$2,341	80%	95%	\$2.67	0.00
Electric	Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	114	15	\$2,341	80%	95%	\$2.67	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	250	14	\$6,067	5.0%	95%	\$3.31	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	250	14	\$6,067	5.0%	95%	\$3.31	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	330	14	\$6,067	5.0%	95%	\$2.50	0.00
Electric	Warehouse	Heat Pump	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	330	14	\$6,067	5.0%	95%	\$2.50	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	60	40	\$67,768	2.0%	100%	\$99.08	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	60	40	\$67,768	2.0%	100%	\$99.08	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	114	40	\$67,768	2.0%	100%	\$52.50	0.00
Electric	Warehouse	Heat Pump	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	114	40	\$67,768	2.0%	100%	\$52.50	0.00
Electric	Warehouse	Heat Pump	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBtuh - Advanced Efficiency	Advanced Efficiency - 16.2 EER, 4.0 COP	Standard Efficiency - 11.0 EER, 3.3 COP	Per Building	New	862	30	\$51,622	5.0%	N/A	\$5.52	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	41	25	\$1,694	75%	85%	\$4.14	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	41	25	\$1,694	75%	85%	\$4.14	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	54	25	\$1,694	75%	85%	\$3.15	0.00
Electric	Warehouse	Heat Pump	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	54	25	\$1,694	75%	85%	\$3.15	0.00
Electric	Warehouse	Heat Pump	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	50	20	\$305	45%	85%	\$0.68	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	86	25	\$1,940	15%	95%	\$2.29	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	86	25	\$1,940	15%	95%	\$2.29	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	120	25	\$1,940	15%	95%	\$1.63	0.00
Electric	Warehouse	Heat Pump	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	120	25	\$1,940	15%	95%	\$1.63	0.00
Electric	Warehouse	Heat Pump	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	41	25	\$1,616	95%	85%	\$3.97	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	New	25	10	\$416	0.0%	0%	\$2.76	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	New	25	10	\$416	0.0%	0%	\$2.76	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	New	76	10	\$416	0.0%	0%	\$0.92	0.00
Electric	Warehouse	Heat Pump	Window Film	Window Film	No Film	Per Building	New	76	10	\$416	0.0%	0%	\$0.92	0.00
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	73	25	\$4	80%	90%	\$0.01	6,928
Electric	Warehouse	Heat Pump	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	73	25	\$4	80%	90%	\$0.01	15,220
Electric	Warehouse	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	Existing	405	8	\$556	75%	70%	\$0.27	0.00
Electric	Warehouse	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	Existing	337	15	\$681	62%	90%	\$0.26	0.00
Electric	Warehouse	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	203	8	\$1,829	90%	90%	\$1.80	0.00
Electric	Warehouse	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	Existing	1,218	17	\$828	75%	50%	\$0.08	0.00
Electric	Warehouse	Lighting Exterior	Time Clock	Time Clock	No Controls	Per Building	Existing	140	8	\$129	25%	25%	\$0.18	0.00
Electric	Warehouse	Lighting Exterior	Daylighting Controls, Outdoors (Photocell)	Photocell	No Controls	Per Building	New	405	8	\$556	75%	70%	\$0.27	0.00
Electric	Warehouse	Lighting Exterior	Exterior Building Lighting	20% savings	Normal Lighting	Per Building	New	337	15	\$681	62%	90%	\$0.26	0.00
Electric	Warehouse	Lighting Exterior	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	203	8	\$1,829	90%	90%	\$1.80	0.00
Electric	Warehouse	Lighting Exterior	Parking - Surface Lighting	Surface Parking Lighting	Normal Lighting	Per Building	New	1,218	17	\$828	75%	50%	\$0.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control	Continuous Full Power Lighting in Stairways during unoccupied Time	Per Building	Existing	225	10	\$832	0.5%	75%	\$0.63	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	1,262	8	\$6,542	10%	95%	\$1.04	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	Existing	946	8	\$4,907	10%	95%	\$1.04	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,544	13	\$11,593	50%	N/A	\$1.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,544	13	\$11,593	50%	N/A	\$1.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,547	13	\$11,618	50%	N/A	\$1.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T5 - Above Standard	Above Standard Fluorescent T5 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	1,547	13	\$11,618	50%	N/A	\$1.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	345	13	\$224	100%	N/A	\$0.13	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	345	13	\$224	100%	N/A	\$0.13	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	346	13	\$223	100%	N/A	\$0.12	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 - Above Standard	Above Standard Fluorescent T8 Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	346	13	\$223	100%	N/A	\$0.12	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	636	13	\$1,271	100%	N/A	\$0.30	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	636	13	\$1,271	100%	N/A	\$0.30	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	719	13	\$1,269	100%	N/A	\$0.27	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 High Performance - Above Standard	Above Standard Fluorescent T8 High Performance Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	719	13	\$1,269	100%	N/A	\$0.27	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	635	13	\$462	100%	N/A	\$0.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	635	13	\$462	100%	N/A	\$0.08	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	720	13	\$463	100%	N/A	\$0.07	8,458,649
Electric	Warehouse	Lighting Interior Fluorescent	Lighting Interior - Fluorescent T8 Reduced Wattage - Above Standard	Above Standard Fluorescent T8 Reduced Wattage Interior Lighting	Standard Fluorescent EISA T12 Interior Lighting	Per Building	Existing	720	13	\$463	100%	N/A	\$0.07	8,458,649
Electric	Warehouse	Lighting Interior Fluorescent	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,222	8	\$1,829	75%	90%	\$0.30	0.00
Electric	Warehouse	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	845	8	\$129	5.0%	25%	\$0.03	198,690
Electric	Warehouse	Lighting Interior Fluorescent	Time Clock	Time Clock	No Controls	Per Building	Existing	845	8	\$129	5.0%	25%	\$0.03	200,631
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - Efficient Metal Halide - Above Standard	Above Standard Efficient Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,703	15	\$1,178	100%	N/A	\$0.11	0.00
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Above Standard High Bay Fluorescent High Output Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	2,224	15	\$4,237	95%	N/A	\$0.25	0.00
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - High Bay LED - Above Standard	Above Standard High Bay LED Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,884	22	\$29,929	50%	N/A	\$1.67	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,146	15	\$231	25%	N/A	\$-0.00	1,019,727
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - Induction - Above Standard	Above Standard Induction Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	1,146	15	\$231	25%	N/A	\$-0.00	1,057,969
Electric	Warehouse	Lighting Interior Hid	Lighting Interior - Metal Halide - Above Standard	Above Standard Metal Halide Interior Lighting	Standard High Pressure Sodium Interior Lighting	Per Building	Existing	516	15	\$19,002	100%	N/A	\$4.66	0.00
Electric	Warehouse	Lighting Interior Hid	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	1,054	8	\$1,829	75%	90%	\$0.35	0.00
Electric	Warehouse	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	729	8	\$129	10%	25%	\$0.04	380,197
Electric	Warehouse	Lighting Interior Hid	Time Clock	Time Clock	No Controls	Per Building	Existing	729	8	\$129	10%	25%	\$0.04	408,975
Electric	Warehouse	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	49	11	\$19	95%	65%	\$0.06	628,565
Electric	Warehouse	Lighting Interior Other	Exit Sign - LED	LED Exit Sign	CFL Exit Sign	Per Building	Existing	49	11	\$19	95%	65%	\$0.06	676,141
Electric	Warehouse	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	Existing	9	13	\$8	95%	95%	\$0.12	0.00
Electric	Warehouse	Lighting Interior Other	Bi-Level Control, Stairwell Lighting	Occupancy Sensor Control, 50% Lighting Power during unoccupied Time	Continuous Full Power Lighting in Stairways	Per Building	New	367	10	\$832	0.5%	75%	\$0.38	0.00
Electric	Warehouse	Lighting Interior Other	Dimming-Continuous, Fluorescent Fixtures	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	931	8	\$6,542	10%	95%	\$1.40	0.00
Electric	Warehouse	Lighting Interior Other	Dimming-Stepped, Fluorescent Fixtures	3-stepped Dimming of Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Building	New	698	8	\$4,907	10%	95%	\$1.40	0.00
Electric	Warehouse	Lighting Interior Other	Exit Sign - Photoluminescent or Tritium	Photoluminescent or Tritium	LED Exit Sign	Per Building	New	9	13	\$8	95%	95%	\$0.12	0.00
Electric	Warehouse	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,022	13	\$6,180	100%	N/A	\$0.44	0.00
Electric	Warehouse	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,022	13	\$6,180	100%	N/A	\$0.44	0.00
Electric	Warehouse	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,389	13	\$4,943	100%	N/A	\$0.30	0.00
Electric	Warehouse	Lighting Interior Other	Lighting Package - High Efficiency	13% LPD Reduction	Standard Lighting Power Density (LPD)	Per Building	New	2,389	13	\$4,943	100%	N/A	\$0.30	0.00
Electric	Warehouse	Lighting Interior Other	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	New	1,994	8	\$1,829	75%	90%	\$0.18	0.00
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,575	4	\$28	85%	N/A	\$-0.02	0.00
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base CFL - Above Standard	Above Standard Screw Base Interior CFL Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,711	4	\$45	85%	N/A	\$-0.02	0.00
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	2,989	1	\$8	100%	N/A	\$0.01	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base Incandescent - Backstop EISA Standard	Standard Screw Base Interior Backstop EISA Incandescent Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	4,775	1	\$14	100%	N/A	\$0.01	0.00
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,602	12	\$728	85%	N/A	\$0.01	6,806,847
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	3,602	12	\$728	85%	N/A	\$0.01	6,806,847
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,755	12	\$1,163	85%	N/A	\$0.01	10,483,922
Electric	Warehouse	Lighting Interior Screw Base	Lighting Interior - Screw Base LED - Above Standard	Above Standard Screw Base Interior LED Lighting	Standard Screw Base Interior EISA Incandescent Lighting	Per Building	Existing	5,755	12	\$1,163	85%	N/A	\$0.01	10,483,922
Electric	Warehouse	Lighting Interior Screw Base	Occupancy Sensor Control	Occupancy Sensor Control	No Occupancy Sensor	Per Building	Existing	489	8	\$1,829	75%	90%	\$0.75	0.00
Electric	Warehouse	Lighting Interior Screw Base	Time Clock	Time Clock	No Controls	Per Building	Existing	338	8	\$129	1.0%	25%	\$0.08	0.00
Electric	Warehouse	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$0.66	10%	90%	\$0.05	5,493
Electric	Warehouse	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	Existing	3	7	\$0.66	10%	90%	\$0.05	6,049
Electric	Warehouse	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	Existing	7	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Warehouse	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	153	10	\$0.66	95%	75%	\$0.00	2,640,009
Electric	Warehouse	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	Existing	153	10	\$0.66	95%	75%	\$0.00	2,907,289
Electric	Warehouse	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	Existing	66	4	\$13	60%	90%	\$0.07	0.00
Electric	Warehouse	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$0.66	10%	90%	\$0.05	631
Electric	Warehouse	Other Plug Load	ENERGY STAR - Battery Charging System	ENERGY STAR Battery Charging System	Non-ENERGY STAR Battery Chargers	Per Building	New	3	7	\$0.66	10%	90%	\$0.05	736
Electric	Warehouse	Other Plug Load	ENERGY STAR - Scanners	ENERGY STAR Scanners	Standard Scanner	Per Building	New	7	4	\$0.00	10%	45%	\$0.00	0.00
Electric	Warehouse	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	153	10	\$0.66	95%	75%	\$0.00	303,333
Electric	Warehouse	Other Plug Load	ENERGY STAR - Water Cooler	ENERGY STAR Water Cooler (Hot/Cold Water)	Non-ENERGY STAR Water Cooler	Per Building	New	153	10	\$0.66	95%	75%	\$0.00	353,896
Electric	Warehouse	Other Plug Load	Smart Strips	Smart Strip Power Strip	Standard surge protector	Per Building	New	66	4	\$13	60%	90%	\$0.07	0.00
Electric	Warehouse	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	Existing	12	6	\$15	100%	N/A	\$0.31	0.00
Electric	Warehouse	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	12	6	\$15	100%	N/A	\$0.31	8
Electric	Warehouse	Photo Copiers	Copiers - ENERGY STAR	ENERGY STAR Copiers	Standard Copier	Per Building	New	12	6	\$15	100%	N/A	\$0.31	12
Electric	Warehouse	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	28	6	\$4	100%	N/A	\$0.04	4,474
Electric	Warehouse	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	Existing	28	6	\$4	100%	N/A	\$0.04	7,919

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building	New	28	6	\$4	100%	N/A	\$0.04	0.00
Electric	Warehouse	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Building	Existing	2	4	\$2	95%	80%	\$0.26	0.00
Electric	Warehouse	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	Existing	1	15	\$2	10%	95%	\$0.16	0.00
Electric	Warehouse	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Building	New	2	4	\$2	95%	80%	\$0.26	0.00
Electric	Warehouse	Refrigeration	Walk-In Electronically Commutated Motor	ECM Evaporator Fans	Standard Efficiency Motor	Per Building	New	1	15	\$2	10%	95%	\$0.16	0.00
Electric	Warehouse	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	32	20	\$89	100%	N/A	\$0.31	0.00
Electric	Warehouse	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	36	20	\$120	100%	N/A	\$0.37	0.00
Electric	Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	28	20	\$7	100%	N/A	\$0.03	61,813
Electric	Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	28	20	\$7	100%	N/A	\$0.03	65,595
Electric	Warehouse	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	Existing	9	20	\$3	100%	N/A	\$0.04	0.00
Electric	Warehouse	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	225	20	\$24	8.8%	100%	\$0.01	315,536
Electric	Warehouse	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	225	20	\$24	8.8%	100%	\$0.01	315,536
Electric	Warehouse	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	230	20	\$22	8.8%	100%	\$0.01	354,567
Electric	Warehouse	Refrigerators	Residential Refrigerator Recycling	Recycling Existing Refrigerator	Existing Refrigerator	Per Building	Existing	230	20	\$22	8.8%	100%	\$0.01	354,567
Electric	Warehouse	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	32	20	\$89	100%	N/A	\$0.31	0.00
Electric	Warehouse	Refrigerators	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	36	20	\$120	100%	N/A	\$0.37	0.00
Electric	Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	28	20	\$7	100%	N/A	\$0.03	28,071
Electric	Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	28	20	\$7	100%	N/A	\$0.03	29,126
Electric	Warehouse	Refrigerators	Refrigerator - Federal Standard 2015	Federal Standard 2015 Refrigerator	Federal Standard 2001 Refrigerator	Per Building	New	9	20	\$3	100%	N/A	\$0.04	0.00
Electric	Warehouse	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	57	15	\$2,341	80%	95%	\$5.31	0.00
Electric	Warehouse	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	Existing	73	15	\$2,341	80%	95%	\$4.17	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	105	15	\$11,806	2.5%	65%	\$14.62	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	134	15	\$11,806	2.5%	65%	\$11.48	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	105	15	\$9,752	2.5%	65%	\$12.07	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	134	15	\$9,752	2.5%	65%	\$9.48	0.00
Electric	Warehouse	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	57	40	\$67,768	2.0%	100%	\$104.41	0.00
Electric	Warehouse	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	Existing	73	40	\$67,768	2.0%	100%	\$82.00	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	28	12	\$47	10%	60%	\$0.25	8,240
Electric	Warehouse	Room Cool	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	36	12	\$47	10%	60%	\$0.19	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$3,523	45%	65%	\$167.14	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2	25	\$3,523	45%	65%	\$131.27	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.20	25	\$1,694	25%	85%	\$862.37	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	0.25	25	\$1,694	25%	85%	\$677.33	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	53	9	\$50	100%	N/A	\$0.17	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	53	9	\$50	100%	N/A	\$0.17	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	68	9	\$50	100%	N/A	\$0.13	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	68	9	\$50	100%	N/A	\$0.13	0.00
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	72	25	\$4	15%	90%	\$0.01	60,251
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	Existing	92	25	\$4	15%	90%	\$0.01	24,624
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	66	25	\$65	15%	25%	\$0.10	11,818
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.40 (KY State Code)	Average U-Value Existing Conditions	Per Building	Existing	84	25	\$65	15%	25%	\$0.08	4,844
Electric	Warehouse	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	57	15	\$2,341	80%	95%	\$5.31	0.00
Electric	Warehouse	Room Cool	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Building	New	73	15	\$2,341	80%	95%	\$4.17	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	105	15	\$9,445	2.5%	65%	\$11.69	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split AC	ENERGY STAR Mini-Split AC (10,000 Btuh) - 12.0 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	134	15	\$9,445	2.5%	65%	\$9.18	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	105	15	\$7,801	2.5%	65%	\$9.66	0.00
Electric	Warehouse	Room Cool	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	134	15	\$7,801	2.5%	65%	\$7.59	0.00
Electric	Warehouse	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	57	40	\$67,768	2.0%	100%	\$104.41	0.00
Electric	Warehouse	Room Cool	Green Roof	Vegetation on Roof	Standard Dark Colored Roof	Per Building	New	73	40	\$67,768	2.0%	100%	\$82.00	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.20	25	\$1,694	75%	85%	\$862.37	0.00
Electric	Warehouse	Room Cool	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	0.25	25	\$1,694	75%	85%	\$677.33	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	53	9	\$50	100%	N/A	\$0.17	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	53	9	\$50	100%	N/A	\$0.17	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	68	9	\$50	100%	N/A	\$0.13	0.00
Electric	Warehouse	Room Cool	Room Cool - ENERGY STAR	ENERGY STAR Room AC (10,000 Btuh) - 10.8 EER	Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	68	9	\$50	100%	N/A	\$0.13	0.00
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	72	25	\$4	80%	90%	\$0.01	31,643
Electric	Warehouse	Room Cool	Windows-High Efficiency	U-0.32	U-0.40 (KY State Code)	Per Building	New	92	25	\$4	80%	90%	\$0.01	15,275
Electric	Warehouse	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	Existing	347	15	\$9,756	2.5%	65%	\$3.67	0.00
Electric	Warehouse	Room Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	56	12	\$47	10%	60%	\$0.13	0.00
Electric	Warehouse	Room Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	106	25	\$3,523	45%	65%	\$3.38	0.00
Electric	Warehouse	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	13	25	\$1,694	25%	85%	\$12.36	0.00
Electric	Warehouse	Room Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	195	25	\$6,288	15%	85%	\$3.27	0.00
Electric	Warehouse	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	25	25	\$1,940	15%	95%	\$7.88	0.00
Electric	Warehouse	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	67	25	\$15,459	10%	45%	\$23.20	0.00
Electric	Warehouse	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	67	25	\$15,459	10%	45%	\$23.20	0.00
Electric	Warehouse	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	178	25	\$15,459	10%	45%	\$8.84	0.00
Electric	Warehouse	Room Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	178	25	\$15,459	10%	45%	\$8.84	0.00
Electric	Warehouse	Room Heat	ENERGY STAR - Mini-Split Heat Pump	ENERGY STAR Mini-Split Heat Pump (10,000 Btuh) - 12.0 EER, 9.0 HSPF	Standard Baseboard Heat and Federal Standard 2000 Room AC (10,000 Btuh) - 9.8 EER	Per Building	New	347	15	\$6,690	2.5%	65%	\$2.52	0.00
Electric	Warehouse	Room Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	13	25	\$1,694	75%	85%	\$12.36	0.00
Electric	Warehouse	Room Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	25	25	\$1,940	15%	95%	\$7.88	0.00
Electric	Warehouse	Room Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	67	25	\$1,616	95%	85%	\$2.43	0.00
Electric	Warehouse	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	36	9	\$4	100%	N/A	\$0.02	447,703
Electric	Warehouse	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	Existing	36	9	\$4	100%	N/A	\$0.02	461,126
Electric	Warehouse	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	36	9	\$4	100%	N/A	\$0.02	59,085
Electric	Warehouse	Servers	Server - High Efficiency	High Efficiency Server	Standard Server	Per Building	New	36	9	\$4	100%	N/A	\$0.02	67,861
Electric	Warehouse	Space Heat	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	24	18	\$1,605	45%	85%	\$7.72	0.00
Electric	Warehouse	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	147	14	\$6,067	5.0%	95%	\$5.60	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Space Heat	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	98	12	\$47	10%	60%	\$0.07	0.00
Electric	Warehouse	Space Heat	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	186	25	\$3,523	45%	65%	\$1.92	0.00
Electric	Warehouse	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	24	25	\$1,694	25%	85%	\$7.04	0.00
Electric	Warehouse	Space Heat	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	29	20	\$1,739	45%	60%	\$6.61	0.00
Electric	Warehouse	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	17	20	\$305	45%	85%	\$1.93	0.00
Electric	Warehouse	Space Heat	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	343	25	\$6,288	15%	85%	\$1.86	0.00
Electric	Warehouse	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	44	25	\$1,940	15%	95%	\$4.49	0.00
Electric	Warehouse	Space Heat	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	312	25	\$15,459	10%	45%	\$5.03	0.00
Electric	Warehouse	Space Heat	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	122	7	\$1,318	90%	95%	\$2.38	0.00
Electric	Warehouse	Space Heat	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	32	7	\$4,950	95%	95%	\$34.02	0.00
Electric	Warehouse	Space Heat	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	147	14	\$6,067	5.0%	95%	\$5.60	0.00
Electric	Warehouse	Space Heat	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	24	25	\$1,694	75%	85%	\$7.04	0.00
Electric	Warehouse	Space Heat	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	17	20	\$305	45%	85%	\$1.93	0.00
Electric	Warehouse	Space Heat	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	44	25	\$1,940	15%	95%	\$4.49	0.00
Electric	Warehouse	Space Heat	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	119	25	\$1,616	95%	85%	\$1.38	0.00
Electric	Warehouse	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	123	10	\$16	100%	N/A	\$0.02	838,304
Electric	Warehouse	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	Existing	123	10	\$16	100%	N/A	\$0.02	855,388
Electric	Warehouse	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	123	10	\$16	100%	N/A	\$0.02	152,965
Electric	Warehouse	Vending Machines	Vending Machines - High Efficiency	ENERGY STAR (Tier 2) Vending Machines - High Efficiency 500 can capacity Under 5.92 kWh/day	Standard Vending Machines - 13 kWh/day	Per Building	New	123	10	\$16	100%	N/A	\$0.02	175,291
Electric	Warehouse	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	Existing	21	15	\$44	95%	90%	\$0.27	0.00
Electric	Warehouse	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	Existing	537	20	\$745	55%	65%	\$0.16	0.00
Electric	Warehouse	Ventilation And Circulation	Motor Rewind	>15, <500 HP	No Rewind	Per Building	Existing	118	7	\$33	65%	25%	\$0.06	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Ventilation And Circulation	Motor - CEE Premium-Efficiency Plus	CEE PE+ Motor for HVAC Applications	NEMA Efficiency Motors	Per Building	New	21	15	\$44	95%	90%	\$0.27	0.00
Electric	Warehouse	Ventilation And Circulation	Motor - Pump & Fan System - Variable Speed Control	Pump And Fan System Optimization with VSD	No Pump And Fan System VSD Optimization	Per Building	New	537	20	\$745	55%	45%	\$0.16	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	11	10	\$1,858	55%	95%	\$28.14	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$4	75%	35%	\$0.45	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	2	12	\$25	75%	75%	\$1.70	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	44	25	\$799	2.5%	95%	\$1.81	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	8	9	\$0.00	95%	75%	\$0.00	19,359
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	8	9	\$0.00	95%	75%	\$0.00	20,922
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	3	9	\$0.00	95%	50%	\$0.00	5,314
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	3	9	\$0.00	95%	50%	\$0.00	5,743
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$5	95%	25%	\$0.73	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	111	10	\$12	95%	85%	\$0.02	235,756
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	111	10	\$12	95%	85%	\$0.02	254,792
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	90	10	\$28	95%	25%	\$0.05	55,922
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	90	10	\$28	95%	25%	\$0.05	60,438
Electric	Warehouse	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	5	10	\$78	75%	95%	\$2.37	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	134	15	\$242	75%	N/A	\$0.32	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	Existing	132	15	\$144	75%	N/A	\$0.22	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	11	10	\$1,858	55%	95%	\$28.37	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$4	75%	35%	\$0.45	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	44	25	\$640	2.5%	95%	\$1.46	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	8	9	\$0.00	95%	75%	\$0.00	1,588
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	8	9	\$0.00	95%	75%	\$0.00	1,951
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	3	9	\$0.00	95%	50%	\$0.00	436

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	3	9	\$0.00	95%	50%	\$0.00	535
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	111	10	\$12	95%	85%	\$0.02	19,506
Electric	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	111	10	\$12	95%	85%	\$0.02	23,961
Electric	Warehouse	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	5	10	\$78	75%	95%	\$2.39	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater GT 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	134	15	\$242	75%	N/A	\$0.32	0.00
Electric	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Heat Pump - Federal Standard 2015	Federal Standard 2015 Heat Pump Water Heater GT 55 Gal - EF 1.97	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.87	Per Building	New	132	15	\$144	75%	N/A	\$0.22	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	11	10	\$1,858	25%	95%	\$26.92	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$4	75%	35%	\$0.45	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	2	12	\$25	75%	75%	\$1.63	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	46	25	\$799	2.5%	95%	\$1.74	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	9	9	\$0.00	95%	75%	\$0.00	45,839
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	9	9	\$0.00	95%	75%	\$0.00	49,543
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	3	9	\$0.00	95%	50%	\$0.00	12,583
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	3	9	\$0.00	95%	50%	\$0.00	13,600
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$5	95%	25%	\$0.70	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	111	10	\$12	95%	85%	\$0.02	534,167
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	111	10	\$12	95%	85%	\$0.02	577,332
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	90	10	\$28	95%	25%	\$0.05	126,708
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	90	10	\$28	95%	25%	\$0.05	136,947
Electric	Warehouse	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	5	10	\$78	75%	95%	\$2.27	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	123	15	\$1,241	75%	N/A	\$1.47	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	Existing	7	15	\$54	100%	N/A	\$0.98	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	11	10	\$1,858	25%	95%	\$27.76	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$4	75%	35%	\$0.45	0.00

Table F.2. Commercial Electric Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per kWh)	2033 Cumulative Achievable Technical Potential (kWh)
Electric	Warehouse	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	45	25	\$640	2.5%	95%	\$1.43	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	8	9	\$0.00	95%	75%	\$0.00	4,826
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	8	9	\$0.00	95%	75%	\$0.00	5,849
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	3	9	\$0.00	95%	50%	\$0.00	1,324
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	3	9	\$0.00	95%	50%	\$0.00	1,605
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	111	10	\$12	95%	85%	\$0.02	57,974
Electric	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	111	10	\$12	95%	85%	\$0.02	70,266
Electric	Warehouse	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	5	10	\$78	75%	95%	\$2.34	0.00
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	123	15	\$1,241	75%	N/A	\$1.47	6
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Heat Pump - ENERGY STAR	ENERGY STAR Heat Pump Water Heater LE 55 Gal - EF 2.0	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	123	15	\$1,241	75%	N/A	\$1.47	14
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	7	15	\$54	100%	N/A	\$0.98	-1.250052
Electric	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.95	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.92	Per Building	New	7	15	\$54	100%	N/A	\$0.98	-11.009568

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	Existing	10	19	\$125	100%	N/A	\$1.36	0.00
Gas	Multifamily	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	New	10	19	\$125	100%	N/A	\$1.36	0.00
Gas	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Dryer - CEF/EF 3.54/3.63	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	Existing	5	11	\$747	100%	N/A	\$23.67	0.00
Gas	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.30/3.38	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	Existing	3	11	\$101	100%	N/A	\$4.17	-8.0182229
Gas	Multifamily	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Dryer - CEF/EF 3.54/3.63	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	New	5	11	\$747	100%	N/A	\$23.67	0.00
Gas	Multifamily	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.30/3.38	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	New	3	11	\$101	100%	N/A	\$4.17	-0.0007411
Gas	Multifamily	Heat Central Boiler	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	67	18	\$1,585	2.5%	95%	\$2.76	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Advanced Efficiency	Advanced Efficiency Boiler - 98% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	89	20	\$3,333	100%	N/A	\$4.17	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Savings Per Building	Existing	28	20	\$378	80%	95%	\$1.50	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - High Efficiency	High Efficiency Boiler - 90% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	48	20	\$2,038	100%	N/A	\$4.68	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Pipe Insulation	R-6 Pipe Insulation	No Insulation	Savings Per Building	Existing	6	15	\$44	95%	30%	\$0.93	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Premium Efficiency	Premium Efficiency Boiler - 94% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	70	20	\$2,457	100%	N/A	\$3.93	0.00
Gas	Multifamily	Heat Central Boiler	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	42	40	\$1,074	25%	62%	\$2.22	0.00
Gas	Multifamily	Heat Central Boiler	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	9	40	\$97	100%	62%	\$0.95	0.00
Gas	Multifamily	Heat Central Boiler	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	5	40	\$26	100%	62%	\$0.43	0.00
Gas	Multifamily	Heat Central Boiler	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	105	18	\$1,162	25%	62%	\$1.30	0.00
Gas	Multifamily	Heat Central Boiler	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	58	40	\$765	25%	62%	\$1.17	0.00
Gas	Multifamily	Heat Central Boiler	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	13	11	\$191	75%	92%	\$2.21	0.00
Gas	Multifamily	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	50	20	-\$212.5446	5.0%	95%	-\$0.47	0.00
Gas	Multifamily	Heat Central Boiler	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	19	11	\$33	100%	94%	\$0.27	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Heat Central Boiler	Quality Installation - Boiler	Quality Installation of Boiler - Commissioning, Controls, and Proper Sizing	Standard Installation of Boiler	Savings Per Building	Existing	28	20	\$225	95%	0%	\$0.89	0.00
Gas	Multifamily	Heat Central Boiler	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	11	40	\$108	0.0%	95%	\$0.86	0.00
Gas	Multifamily	Heat Central Boiler	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	60	40	\$611	50%	62%	\$0.89	0.00
Gas	Multifamily	Heat Central Boiler	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	19	11	\$172	10%	100%	\$1.38	0.00
Gas	Multifamily	Heat Central Boiler	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	30	25	\$3,341	95%	50%	\$11.28	0.00
Gas	Multifamily	Heat Central Boiler	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	36	25	\$5,820	95%	100%	\$16.14	0.00
Gas	Multifamily	Heat Central Boiler	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	55	18	\$1,585	20%	95%	\$3.36	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Advanced Efficiency	Advanced Efficiency Boiler - 98% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	73	20	\$3,333	100%	N/A	\$5.07	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Savings Per Building	New	23	20	\$378	0.0%	95%	\$1.82	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - High Efficiency	High Efficiency Boiler - 90% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	40	20	\$2,038	100%	N/A	\$5.69	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Pipe Insulation	R-6 Pipe Insulation	No Insulation	Savings Per Building	New	6	15	\$44	0.0%	30%	\$0.93	0.00
Gas	Multifamily	Heat Central Boiler	Boiler - Premium Efficiency	Premium Efficiency Boiler - 94% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	57	20	\$2,457	100%	N/A	\$4.78	0.00
Gas	Multifamily	Heat Central Boiler	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$218	75%	62%	\$3.40	0.00
Gas	Multifamily	Heat Central Boiler	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	60	40	\$2,145	5.0%	**%	\$3.15	0.00
Gas	Multifamily	Heat Central Boiler	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	8	40	\$97	100%	62%	\$0.97	0.00
Gas	Multifamily	Heat Central Boiler	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	5	40	\$26	100%	62%	\$0.44	0.00
Gas	Multifamily	Heat Central Boiler	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	3	40	\$211	75%	62%	\$5.60	0.00
Gas	Multifamily	Heat Central Boiler	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	23	40	\$14,737	10%	**%	\$56.21	0.00
Gas	Multifamily	Heat Central Boiler	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	42	20	\$495	0.0%	95%	\$1.30	0.00
Gas	Multifamily	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	41	20	-\$192.9165	10%	95%	-\$0.52	0.00
Gas	Multifamily	Heat Central Boiler	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	26	40	\$358	20%	75%	\$1.18	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Heat Central Boiler	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	10	40	\$102	75%	90%	\$0.88	0.00
Gas	Multifamily	Heat Central Boiler	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	16	11	\$172	10%	100%	\$1.68	0.00
Gas	Multifamily	Heat Central Boiler	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	7	25	\$1,043	95%	50%	\$13.29	0.00
Gas	Multifamily	Heat Central Boiler	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	15	25	\$4,143	95%	100%	\$26.38	0.00
Gas	Multifamily	Heat Central Furnace	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	42	40	\$1,074	25%	62%	\$2.22	0.00
Gas	Multifamily	Heat Central Furnace	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	9	40	\$97	100%	62%	\$0.95	0.00
Gas	Multifamily	Heat Central Furnace	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	5	40	\$26	100%	62%	\$0.43	52,431
Gas	Multifamily	Heat Central Furnace	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	63	18	\$1,162	25%	62%	\$2.15	0.00
Gas	Multifamily	Heat Central Furnace	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	58	40	\$765	25%	62%	\$1.17	0.00
Gas	Multifamily	Heat Central Furnace	Furnace - ENERGY STAR	ENERGY STAR Furnace - 90% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	45	20	\$248	100%	N/A	\$0.62	336,278
Gas	Multifamily	Heat Central Furnace	Furnace - High Efficiency	High Efficiency Furnace - 94% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	57	20	\$525	100%	N/A	\$1.02	0.00
Gas	Multifamily	Heat Central Furnace	Furnace - Premium Efficiency	Premium Efficiency Furnace - 98% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	69	20	\$828	100%	N/A	\$1.35	0.00
Gas	Multifamily	Heat Central Furnace	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	8	11	\$191	75%	92%	\$3.65	0.00
Gas	Multifamily	Heat Central Furnace	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	12	11	\$33	100%	94%	\$0.44	181,880
Gas	Multifamily	Heat Central Furnace	Quality Installation - Furnace	Quality Installation of Furnace - Commissioning, Controls, and Proper Sizing	Standard Installation of Furnace	Savings Per Building	Existing	6	20	\$225	95%	0%	\$3.68	0.00
Gas	Multifamily	Heat Central Furnace	Tune-up - Furnace (Gas)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	24	5	\$114	95%	75%	\$1.36	0.00
Gas	Multifamily	Heat Central Furnace	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	11	40	\$108	0.0%	95%	\$0.86	0.00
Gas	Multifamily	Heat Central Furnace	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	60	40	\$611	50%	62%	\$0.89	293,631
Gas	Multifamily	Heat Central Furnace	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	12	11	\$172	10%	100%	\$2.28	0.00
Gas	Multifamily	Heat Central Furnace	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	30	25	\$3,341	95%	50%	\$11.28	0.00
Gas	Multifamily	Heat Central Furnace	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	36	25	\$5,820	95%	100%	\$16.14	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Heat Central Furnace	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	5	40	\$218	75%	62%	\$3.73	0.00
Gas	Multifamily	Heat Central Furnace	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	31	40	\$2,145	5.0%	***	\$6.01	0.00
Gas	Multifamily	Heat Central Furnace	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	8	40	\$97	100%	62%	\$1.07	0.00
Gas	Multifamily	Heat Central Furnace	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	4	40	\$26	100%	62%	\$0.48	918
Gas	Multifamily	Heat Central Furnace	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	3	40	\$211	75%	62%	\$6.15	0.00
Gas	Multifamily	Heat Central Furnace	Furnace - ENERGY STAR	ENERGY STAR Furnace - 90% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	32	20	\$248	100%	N/A	\$0.87	0.00
Gas	Multifamily	Heat Central Furnace	Furnace - High Efficiency	High Efficiency Furnace - 94% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	41	20	\$525	100%	N/A	\$1.44	0.00
Gas	Multifamily	Heat Central Furnace	Furnace - Premium Efficiency	Premium Efficiency Furnace - 98% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	49	20	\$828	100%	N/A	\$1.89	0.00
Gas	Multifamily	Heat Central Furnace	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	12	40	\$14,737	10%	***	\$107.29	0.00
Gas	Multifamily	Heat Central Furnace	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	22	20	\$495	0.0%	95%	\$2.48	0.00
Gas	Multifamily	Heat Central Furnace	Quality Installation - Furnace	Quality Installation of Furnace - Commissioning, Controls, and Proper Sizing	Standard Installation of Furnace	Savings Per Building	New	4	20	\$225	95%	0%	\$5.18	0.00
Gas	Multifamily	Heat Central Furnace	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	24	40	\$358	20%	75%	\$1.30	0.00
Gas	Multifamily	Heat Central Furnace	Tune-up - Furnace (Gas)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	New	17	5	\$114	0.0%	75%	\$1.92	0.00
Gas	Multifamily	Heat Central Furnace	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	9	40	\$102	75%	90%	\$0.97	0.00
Gas	Multifamily	Heat Central Furnace	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	8	11	\$172	10%	100%	\$3.21	0.00
Gas	Multifamily	Heat Central Furnace	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	7	25	\$1,043	95%	50%	\$14.58	0.00
Gas	Multifamily	Heat Central Furnace	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	14	25	\$4,143	95%	100%	\$28.95	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	51	20	-\$193.3679	0.0%	95%	-\$0.42	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater > 55 GAL	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	111	20	\$4,675	20%	N/A	\$5.06	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - Condensing	Condensing Water Heater > 55 GAL - EF 0.85	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	61	13	\$1,448	10%	N/A	\$3.35	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater > 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	34	13	\$631	100%	N/A	\$2.63	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - Federal Standard 2015 Condensing	Federal Standard 2015 Condensing Water Heater > 55 GAL - EF 0.74	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	46	13	\$947	10%	N/A	\$2.91	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	51	20	-\$212.9959	0.0%	95%	-\$0.46	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater > 55 GAL	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	111	20	\$4,675	20%	N/A	\$5.06	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - Condensing	Condensing Water Heater > 55 GAL - EF 0.85	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	61	13	\$1,448	30%	N/A	\$3.35	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater > 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	34	13	\$631	100%	N/A	\$2.63	0.00
Gas	Multifamily	Water Heat GT 55 Gal	Water Heater - Federal Standard 2015 Condensing	Federal Standard 2015 Condensing Water Heater > 55 GAL - EF 0.74	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	46	13	\$947	30%	N/A	\$2.91	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	6	11	\$140	60%	38%	\$3.29	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	2	11	\$58	60%	38%	\$3.82	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	11	11	\$210	60%	38%	\$2.83	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	8	11	\$198	60%	38%	\$3.58	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$116	60%	38%	\$4.17	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	13	11	\$268	60%	38%	\$3.08	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	9	11	\$152	60%	38%	\$2.57	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$70	60%	38%	\$2.21	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$161	33%	77%	\$11.05	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	0.77	11	\$7	33%	77%	\$1.50	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$309	59%	77%	\$19.10	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$155	59%	77%	\$23.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	1	11	\$154	59%	77%	\$15.82	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	21	40	\$935	0.5%	***	\$3.81	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	2	10	\$3	100%	25%	\$0.20	2,482
Gas	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	2	10	\$1	50%	65%	\$0.08	2,823
Gas	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	6	10	\$2	50%	95%	\$0.06	10,022
Gas	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	9	10	\$9	100%	65%	\$0.18	21,960
Gas	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	9	10	\$29	100%	10%	\$0.52	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	2	15	\$3	85%	30%	\$0.21	2,037
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	6	11	\$140	60%	38%	\$3.29	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	2	11	\$58	60%	38%	\$3.82	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	11	11	\$210	60%	38%	\$2.83	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	8	11	\$198	60%	38%	\$3.58	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$116	60%	38%	\$4.17	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	13	11	\$268	60%	38%	\$3.08	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	9	11	\$152	60%	38%	\$2.57	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$70	60%	38%	\$2.21	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$161	33%	77%	\$11.05	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	0.77	11	\$7	33%	77%	\$1.50	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$309	59%	77%	\$19.10	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$155	59%	77%	\$23.99	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	1	11	\$154	59%	77%	\$15.82	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	21	40	\$935	0.5%	***	\$3.83	0.00
Gas	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	2	10	\$1	50%	65%	\$0.08	53
Gas	Multifamily	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	6	10	\$2	50%	95%	\$0.06	190
Gas	Multifamily	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	9	10	\$9	100%	65%	\$0.18	416
Gas	Multifamily	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	2	15	\$3	100%	0%	\$0.21	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	46	20	-\$193.3679	0.0%	95%	-\$0.47	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	100	20	\$5,315	20%	N/A	\$6.35	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - Condensing	Condensing Water Heater = 55 GAL - EF 0.90	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	50	13	\$1,360	10%	N/A	\$3.83	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater = 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	17	13	\$186	100%	N/A	\$1.51	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Tankless	ENERGY STAR Tankless Water Heater = 55 GAL - EF 0.82	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	41	13	\$640	10%	N/A	\$2.21	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.62	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	7	13	\$60	100%	N/A	\$1.22	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	46	20	-\$212.9959	0.0%	95%	-\$0.52	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	100	20	\$5,315	20%	N/A	\$6.35	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - Condensing	Condensing Water Heater = 55 GAL - EF 0.90	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	50	13	\$1,360	30%	N/A	\$3.83	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater = 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	17	13	\$186	100%	N/A	\$1.51	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Tankless	ENERGY STAR Tankless Water Heater = 55 GAL - EF 0.82	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	41	13	\$640	30%	N/A	\$2.21	0.00
Gas	Multifamily	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.62	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	7	13	\$60	100%	N/A	\$1.22	-0.4142122
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	6	11	\$140	60%	38%	\$3.29	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	2	11	\$58	60%	38%	\$3.82	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	11	11	\$210	60%	38%	\$2.83	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	8	11	\$198	60%	38%	\$3.58	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$116	60%	38%	\$4.17	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	13	11	\$268	60%	38%	\$3.08	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	9	11	\$152	60%	38%	\$2.57	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$70	60%	38%	\$2.21	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$161	33%	77%	\$11.05	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	0.77	11	\$7	33%	77%	\$1.50	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$309	59%	77%	\$19.10	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$155	59%	77%	\$23.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	1	11	\$154	59%	77%	\$15.82	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	19	40	\$935	0.5%	***	\$4.25	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	2	10	\$3	100%	25%	\$0.20	7,255
Gas	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	2	10	\$1	50%	65%	\$0.08	8,252
Gas	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	6	10	\$2	50%	95%	\$0.06	29,292
Gas	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	9	10	\$9	100%	65%	\$0.18	64,184
Gas	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	9	10	\$29	100%	10%	\$0.52	9,874
Gas	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	2	15	\$3	85%	30%	\$0.21	5,909
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	6	11	\$140	60%	38%	\$3.29	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	2	11	\$58	60%	38%	\$3.82	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	11	11	\$210	60%	38%	\$2.83	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	8	11	\$198	60%	38%	\$3.58	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$116	60%	38%	\$4.17	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	13	11	\$268	60%	38%	\$3.08	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	9	11	\$152	60%	38%	\$2.57	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$70	60%	38%	\$2.21	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	4	11	\$81	60%	38%	\$2.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$161	33%	77%	\$11.05	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	0.77	11	\$7	33%	77%	\$1.50	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$309	59%	77%	\$19.10	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$155	59%	77%	\$23.99	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	1	11	\$154	59%	77%	\$15.82	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	19	40	\$935	0.5%	**	\$4.26	0.00
Gas	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	2	10	\$1	50%	65%	\$0.08	166
Gas	Multifamily	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	6	10	\$2	50%	95%	\$0.06	592
Gas	Multifamily	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	9	10	\$9	100%	65%	\$0.18	1,298

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Multifamily	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	2	15	\$3	100%	0%	\$0.21	0.00
Gas	Single Family	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	Existing	10	19	\$125	100%	N/A	\$1.36	0.00
Gas	Single Family	Cooking Oven	Cooking Oven - High Efficiency	High Efficiency Convection Cooking Oven	Federal Standard 2012 Cooking Oven	Per Installation	New	10	19	\$125	100%	N/A	\$1.36	0.00
Gas	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Dryer - CEF/EF 3.54/3.63	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	Existing	6	11	\$747	100%	N/A	\$17.68	0.00
Gas	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.30/3.38	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	Existing	5	11	\$101	100%	N/A	\$3.12	-178.3380562
Gas	Single Family	Dryer	Dryer - Enhanced Efficiency	Enhanced Efficiency Dryer - CEF/EF 3.54/3.63	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	New	6	11	\$747	100%	N/A	\$17.68	0.00
Gas	Single Family	Dryer	Dryer - Federal Standard 2015	Federal Standard 2015 Dryer - CEF/EF 3.30/3.38	Standard Dryer with Controls and Moisture Sensor - CEF/EF 2.70/2.74	Per Installation	New	5	11	\$101	100%	N/A	\$3.12	-0.0123573
Gas	Single Family	Heat Central Boiler	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	Existing	94	18	\$1,585	13%	95%	\$1.98	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Advanced Efficiency	Advanced Efficiency Boiler - 98% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	125	20	\$5,000	100%	N/A	\$4.48	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Savings Per Building	Existing	39	20	\$378	80%	95%	\$1.07	0.00
Gas	Single Family	Heat Central Boiler	Boiler - High Efficiency	High Efficiency Boiler - 90% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	68	20	\$3,057	100%	N/A	\$5.03	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6 Pipe Insulation	No Insulation	Savings Per Building	Existing	7	15	\$44	95%	30%	\$0.72	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Premium Efficiency	Premium Efficiency Boiler - 94% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	Existing	97	20	\$3,685	100%	N/A	\$4.22	0.00
Gas	Single Family	Heat Central Boiler	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	56	40	\$1,422	85%	64%	\$2.22	0.00
Gas	Single Family	Heat Central Boiler	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	18	40	\$194	100%	64%	\$0.95	0.00
Gas	Single Family	Heat Central Boiler	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	10	40	\$52	100%	64%	\$0.43	0.00
Gas	Single Family	Heat Central Boiler	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	146	18	\$1,162	25%	64%	\$0.94	0.00
Gas	Single Family	Heat Central Boiler	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	77	40	\$1,014	25%	64%	\$1.17	0.00
Gas	Single Family	Heat Central Boiler	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	20	11	\$320	75%	62%	\$2.47	0.00
Gas	Single Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	17	40	\$132	35%	64%	\$0.66	0.00
Gas	Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	71	20	\$-224.7142	75%	95%	\$-0.35	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Heat Central Boiler	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	27	11	\$33	100%	72%	\$0.19	0.00
Gas	Single Family	Heat Central Boiler	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	34	40	\$332	0.0%	95%	\$0.86	0.00
Gas	Single Family	Heat Central Boiler	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	187	40	\$1,881	75%	64%	\$0.89	0.00
Gas	Single Family	Heat Central Boiler	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	27	11	\$172	95%	100%	\$0.99	0.00
Gas	Single Family	Heat Central Boiler	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	70	25	\$7,807	95%	44%	\$11.28	0.00
Gas	Single Family	Heat Central Boiler	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	85	25	\$13,602	95%	99%	\$16.14	0.00
Gas	Single Family	Heat Central Boiler	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	No Air to Air Heat Exchanger	Savings Per Building	New	87	18	\$1,585	45%	95%	\$2.15	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Advanced Efficiency	Advanced Efficiency Boiler - 98% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	115	20	\$5,000	100%	N/A	\$4.88	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Savings Per Building	New	36	20	\$378	0.0%	95%	\$1.17	0.00
Gas	Single Family	Heat Central Boiler	Boiler - High Efficiency	High Efficiency Boiler - 90% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	62	20	\$3,057	100%	N/A	\$5.48	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6 Pipe Insulation	No Insulation	Savings Per Building	New	7	15	\$44	0.0%	30%	\$0.72	0.00
Gas	Single Family	Heat Central Boiler	Boiler - Premium Efficiency	Premium Efficiency Boiler - 94% AFUE	Federal Standard 2012 Boiler - 82% AFUE	Per Installation	New	89	20	\$3,685	100%	N/A	\$4.60	0.00
Gas	Single Family	Heat Central Boiler	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	7	40	\$289	95%	64%	\$3.40	0.00
Gas	Single Family	Heat Central Boiler	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	94	40	\$3,581	25%	**%	\$3.37	0.00
Gas	Single Family	Heat Central Boiler	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	17	40	\$194	100%	64%	\$0.97	0.00
Gas	Single Family	Heat Central Boiler	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	10	40	\$52	100%	64%	\$0.44	0.00
Gas	Single Family	Heat Central Boiler	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	4	40	\$280	75%	64%	\$5.60	0.00
Gas	Single Family	Heat Central Boiler	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	36	40	\$18,975	10%	**%	\$46.44	0.00
Gas	Single Family	Heat Central Boiler	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	64	20	\$827	85%	95%	\$1.45	0.00
Gas	Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	65	20	\$-216.3978	75%	95%	\$-0.37	0.00
Gas	Single Family	Heat Central Boiler	Quality Installation - Boiler	Quality Installation of Boiler - Commissioning, Controls, and Proper Sizing	Standard Installation of Boiler	Savings Per Building	New	36	20	\$225	95%	0%	\$0.70	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Heat Central Boiler	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	35	40	\$474	20%	75%	\$1.18	0.00
Gas	Single Family	Heat Central Boiler	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	32	40	\$321	75%	90%	\$0.88	0.00
Gas	Single Family	Heat Central Boiler	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	25	11	\$172	95%	100%	\$1.08	0.00
Gas	Single Family	Heat Central Boiler	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	18	25	\$2,368	95%	44%	\$13.29	0.00
Gas	Single Family	Heat Central Boiler	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	36	25	\$9,405	95%	99%	\$26.38	0.00
Gas	Single Family	Heat Central Furnace	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-15 (Existing Insulation)	Savings Per Building	Existing	56	40	\$1,422	85%	64%	\$2.22	0.00
Gas	Single Family	Heat Central Furnace	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	18	40	\$194	100%	64%	\$0.95	0.00
Gas	Single Family	Heat Central Furnace	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	Existing	10	40	\$52	100%	64%	\$0.43	639,364
Gas	Single Family	Heat Central Furnace	Duct Sealing and Insulation - Code	Code Duct Sealing and Insulation - R-8	Existing Duct Sealing and Insulation - R-4	Savings Per Building	Existing	112	18	\$1,162	25%	64%	\$1.22	0.00
Gas	Single Family	Heat Central Furnace	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-1 (Existing Insulation)	Savings Per Building	Existing	77	40	\$1,014	25%	64%	\$1.17	0.00
Gas	Single Family	Heat Central Furnace	Furnace - ENERGY STAR	ENERGY STAR Furnace - 90% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	79	20	\$372	100%	N/A	\$0.52	3,140,351
Gas	Single Family	Heat Central Furnace	Furnace - High Efficiency	High Efficiency Furnace - 94% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	101	20	\$788	100%	N/A	\$0.87	0.00
Gas	Single Family	Heat Central Furnace	Furnace - Premium Efficiency	Premium Efficiency Furnace - 98% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	Existing	121	20	\$1,242	100%	N/A	\$1.14	0.00
Gas	Single Family	Heat Central Furnace	Infiltration Control - Reduction of Existing Conditions	Infiltration Control - 0.1 ACH Reduction	Existing Infiltration Conditions	Savings Per Building	Existing	15	11	\$320	75%	62%	\$3.23	0.00
Gas	Single Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10)	Average Existing Insulation (R-2.1)	Savings Per Building	Existing	17	40	\$132	35%	64%	\$0.66	0.00
Gas	Single Family	Heat Central Furnace	Programmable Thermostat	Programmable Thermostat	Manual Thermostat	Savings Per Building	Existing	21	11	\$33	100%	72%	\$0.25	1,450,332
Gas	Single Family	Heat Central Furnace	Quality Installation - Furnace	Quality Installation of Furnace	Standard Installation of Furnace	Savings Per Building	Existing	12	20	\$225	95%	0%	\$2.08	0.00
Gas	Single Family	Heat Central Furnace	Tune-up - Furnace (Gas)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	Existing	43	5	\$114	95%	75%	\$0.77	0.00
Gas	Single Family	Heat Central Furnace	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	Existing	34	40	\$332	0.0%	95%	\$0.86	0.00
Gas	Single Family	Heat Central Furnace	Wall Insulation (KY) - Code	R-13 (KY Code - Maximum Insulation Feasible)	R-2 (Existing Insulation)	Savings Per Building	Existing	187	40	\$1,881	75%	64%	\$0.89	8,247,955
Gas	Single Family	Heat Central Furnace	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	Existing	21	11	\$172	95%	100%	\$1.29	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Heat Central Furnace	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	70	25	\$7,807	95%	44%	\$11.28	0.00
Gas	Single Family	Heat Central Furnace	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	Existing Window - Single Pane	Savings Per Building	Existing	85	25	\$13,602	95%	99%	\$16.14	0.00
Gas	Single Family	Heat Central Furnace	Ceiling Insulation (KY) - Above Code	R-49 (Above KY Code)	R-38 (KY Code)	Savings Per Building	New	6	40	\$289	95%	64%	\$3.73	0.00
Gas	Single Family	Heat Central Furnace	Construction - ICF/SIP	Specialty Framing (Insulating Concrete Forms/Structural Insulated Panels)	Standard Wood Framing	Savings Per Building	New	68	40	\$3,581	25%	**%	\$4.66	0.00
Gas	Single Family	Heat Central Furnace	Door (KY) - Above Code	R-10 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	16	40	\$194	100%	64%	\$1.07	0.00
Gas	Single Family	Heat Central Furnace	Door (KY) - Above Code	R-5 Door (Above KY Code)	R-2.9 Door (KY Code)	Savings Per Building	New	9	40	\$52	100%	64%	\$0.48	8,894
Gas	Single Family	Heat Central Furnace	Floor Insulation (KY) - Above Code	R-30 (Above KY Code)	R-19 (KY Code)	Savings Per Building	New	4	40	\$280	75%	64%	\$6.15	0.00
Gas	Single Family	Heat Central Furnace	Furnace - ENERGY STAR	ENERGY STAR Furnace - 90% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	69	20	\$372	100%	N/A	\$0.60	67,676
Gas	Single Family	Heat Central Furnace	Furnace - High Efficiency	High Efficiency Furnace - 94% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	88	20	\$788	100%	N/A	\$1.00	0.00
Gas	Single Family	Heat Central Furnace	Furnace - Premium Efficiency	Premium Efficiency Furnace - 98% AFUE	Federal Standard 1992 Furnace - 78% AFUE	Per Installation	New	105	20	\$1,242	100%	N/A	\$1.32	0.00
Gas	Single Family	Heat Central Furnace	Green Roof	Ecoroof	Standard Roof	Savings Per Building	New	26	40	\$18,975	10%	**%	\$64.12	0.00
Gas	Single Family	Heat Central Furnace	Infiltration Control - Reduction of New Thermal Shell	Thermal Shell 0.2 ACH with Heat Recovery Ventilator (HRV)	Standard New Construction Homes 0.35 ACH	Savings Per Building	New	46	20	\$827	85%	95%	\$2.00	0.00
Gas	Single Family	Heat Central Furnace	Quality Installation - Furnace	Quality Installation of Furnace - Commissioning, Controls, and Proper Sizing	Standard Installation of Furnace	Savings Per Building	New	10	20	\$225	95%	0%	\$2.40	0.00
Gas	Single Family	Heat Central Furnace	Slab Insulation - Above Code	R-15 (Above Code)	R-10 (Code)	Savings Per Building	New	32	40	\$474	20%	75%	\$1.30	0.00
Gas	Single Family	Heat Central Furnace	Tune-up - Furnace (Gas)	Furnace with Tune-up	Furnace with no Tune-up	Savings Per Building	New	37	5	\$114	0.0%	75%	\$0.89	0.00
Gas	Single Family	Heat Central Furnace	Wall Insulation (KY) - Above Code	R-21 (Above KY Code)	R-13 (KY Code)	Savings Per Building	New	29	40	\$321	75%	90%	\$0.97	0.00
Gas	Single Family	Heat Central Furnace	Wi-Fi Thermostat	WiFi Thermostat	Programmable Thermostat	Savings Per Building	New	18	11	\$172	95%	100%	\$1.49	0.00
Gas	Single Family	Heat Central Furnace	Window (KY) - Tier 1 Above Code	U-value 0.30 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	16	25	\$2,368	95%	44%	\$14.58	0.00
Gas	Single Family	Heat Central Furnace	Window (KY) - Tier 2 Above Code	U-value 0.25 Window (Above KY Code)	U-value 0.35 Window (KY Code)	Savings Per Building	New	33	25	\$9,405	95%	99%	\$28.95	0.00
Gas	Single Family	Pool Heat	Pool Covers	Pool Covers	No Pool Cover	Savings Per Building	Existing	128	3	\$231	75%	40%	\$0.82	0.00
Gas	Single Family	Pool Heat	Pool Heater - Efficient	Efficient Pool Heater - 88% Efficient	Standard Pool Heater - 83% Efficient	Per Installation	Existing	14	8	\$563	100%	N/A	\$7.70	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Pool Heat	Pool Heater - Efficient	Efficient Pool Heater - 88% Efficient	Standard Pool Heater - 83% Efficient	Per Installation	New	14	8	\$563	100%	N/A	\$7.70	0.00
Gas	Single Family	Water Heat GT 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	64	20	-\$181.1982	0.0%	95%	-\$0.32	0.00
Gas	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater > 55 GAL	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	138	20	\$4,675	20%	N/A	\$4.09	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - Condensing	Condensing Water Heater > 55 GAL - EF 0.85	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	76	13	\$1,448	90%	N/A	\$2.71	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater > 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	42	13	\$631	100%	N/A	\$2.13	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - Federal Standard 2015 Condensing	Federal Standard 2015 Condensing Water Heater > 55 GAL - EF 0.74	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	Existing	57	13	\$947	90%	N/A	\$2.35	0.00
Gas	Single Family	Water Heat GT 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	63	20	-\$189.5147	0.0%	95%	-\$0.33	0.00
Gas	Single Family	Water Heat GT 55 Gal	Solar Hot Water (SHW)	Solar Water Heater > 55 GAL	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	138	20	\$4,675	20%	N/A	\$4.09	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - Condensing	Condensing Water Heater > 55 GAL - EF 0.85	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	76	13	\$1,448	100%	N/A	\$2.71	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater > 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	42	13	\$631	100%	N/A	\$2.13	0.00
Gas	Single Family	Water Heat GT 55 Gal	Water Heater - Federal Standard 2015 Condensing	Federal Standard 2015 Condensing Water Heater > 55 GAL - EF 0.74	Federal Standard 2004 Storage Water Heater > 55 GAL - EF 0.53	Per Installation	New	57	13	\$947	100%	N/A	\$2.35	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	9	11	\$140	99%	33%	\$2.45	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	3	11	\$58	99%	33%	\$2.85	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	15	11	\$210	99%	33%	\$2.11	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	11	11	\$198	99%	33%	\$2.68	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$116	99%	33%	\$3.11	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	18	11	\$268	99%	33%	\$2.30	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	12	11	\$152	99%	33%	\$1.92	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	6	11	\$70	99%	33%	\$1.65	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	3	11	\$161	71%	30%	\$8.26	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$7	71%	30%	\$1.12	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	3	11	\$309	71%	30%	\$14.27	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$155	71%	30%	\$17.92	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$154	71%	30%	\$11.82	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	26	40	\$935	30%	***	\$3.08	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	6	10	\$5	100%	25%	\$0.15	41,814
Gas	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	5	10	\$2	75%	65%	\$0.06	71,346
Gas	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	13	10	\$3	75%	95%	\$0.04	253,239
Gas	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	19	10	\$15	100%	65%	\$0.13	340,672
Gas	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	19	10	\$44	100%	10%	\$0.38	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	2	15	\$3	95%	30%	\$0.21	16,030
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	9	11	\$140	99%	33%	\$2.45	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	3	11	\$58	99%	33%	\$2.85	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	15	11	\$210	99%	33%	\$2.11	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	11	11	\$198	99%	33%	\$2.68	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$116	99%	33%	\$3.11	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	18	11	\$268	99%	33%	\$2.30	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	12	11	\$152	99%	33%	\$1.92	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	6	11	\$70	99%	33%	\$1.65	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	3	11	\$161	71%	30%	\$8.26	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$7	71%	30%	\$1.12	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	3	11	\$309	71%	30%	\$14.27	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$155	71%	30%	\$17.92	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$154	71%	30%	\$11.82	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	26	40	\$935	60%	**	\$3.10	0.00
Gas	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	5	10	\$2	75%	65%	\$0.06	1,353
Gas	Single Family	Water Heat Gt 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	13	10	\$3	75%	95%	\$0.04	4,802
Gas	Single Family	Water Heat Gt 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	19	10	\$15	100%	65%	\$0.13	6,460

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Gt 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	2	15	\$3	100%	0%	\$0.21	0.00
Gas	Single Family	Water Heat LE 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	Existing	57	20	-\$181.1982	0.0%	95%	-\$0.35	0.00
Gas	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	123	20	\$5,315	20%	N/A	\$5.13	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - Condensing	Condensing Water Heater = 55 GAL - EF 0.90	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	62	13	\$1,360	90%	N/A	\$3.09	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater = 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	21	13	\$186	100%	N/A	\$1.22	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Tankless	ENERGY STAR Tankless Water Heater = 55 GAL - EF 0.82	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	51	13	\$640	90%	N/A	\$1.79	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.62	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	Existing	8	13	\$60	100%	N/A	\$0.99	0.00
Gas	Single Family	Water Heat LE 55 Gal	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Savings Per Building	New	57	20	-\$189.5147	0.0%	95%	-\$0.37	0.00
Gas	Single Family	Water Heat LE 55 Gal	Solar Hot Water (SHW)	Solar Water Heater = 55 GAL	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	123	20	\$5,315	20%	N/A	\$5.13	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - Condensing	Condensing Water Heater = 55 GAL - EF 0.90	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	62	13	\$1,360	100%	N/A	\$3.09	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Storage	ENERGY STAR Storage Water Heater = 55 GAL - EF 0.67	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	21	13	\$186	100%	N/A	\$1.22	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - ENERGY STAR Tankless	ENERGY STAR Tankless Water Heater = 55 GAL - EF 0.82	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	51	13	\$640	100%	N/A	\$1.79	0.00
Gas	Single Family	Water Heat LE 55 Gal	Water Heater - Federal Standard 2015 Storage	Federal Standard 2015 Storage Water Heater = 55 GAL - EF 0.62	Federal Standard 2004 Storage Water Heater = 55 GAL - EF 0.59	Per Installation	New	8	13	\$60	100%	N/A	\$0.99	-2.2940124
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	9	11	\$140	99%	33%	\$2.45	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	3	11	\$58	99%	33%	\$2.85	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	15	11	\$210	99%	33%	\$2.11	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	11	11	\$198	99%	33%	\$2.68	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$116	99%	33%	\$3.11	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	18	11	\$268	99%	33%	\$2.30	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	12	11	\$152	99%	33%	\$1.92	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	Existing	6	11	\$70	99%	33%	\$1.65	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	Existing	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	3	11	\$161	71%	30%	\$8.26	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$7	71%	30%	\$1.12	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	3	11	\$309	71%	30%	\$14.27	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	Existing	1	11	\$155	71%	30%	\$17.92	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	Existing	2	11	\$154	71%	30%	\$11.82	0.00
Gas	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	Existing	24	40	\$935	30%	***	\$3.44	0.00
Gas	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Federal Standard 1994	Federal Standard 1994 Aerator - 2.2 GPM	Existing Faucet Aerator - 3.0 GPM	Savings Per Building	Existing	6	10	\$5	100%	25%	\$0.15	77,967
Gas	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	5	10	\$2	75%	65%	\$0.06	133,031
Gas	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	Existing	13	10	\$3	75%	95%	\$0.04	472,188
Gas	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	Existing	19	10	\$15	100%	65%	\$0.13	635,214
Gas	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead - Federal Standard 1994	Federal Standard 1994 Showerhead - 2.5 GPM	Existing Faucet Showerhead - 3.0 GPM	Savings Per Building	Existing	19	10	\$44	100%	10%	\$0.38	0.00
Gas	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	Existing	2	15	\$3	95%	30%	\$0.21	29,363

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	9	11	\$140	99%	33%	\$2.45	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	3	11	\$58	99%	33%	\$2.85	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 2	CEE Tier 2 Clothes Washer - MEF 2.2 and WF 4.5 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	15	11	\$210	99%	33%	\$2.11	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	11	11	\$198	99%	33%	\$2.68	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$116	99%	33%	\$3.11	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - CEE Tier 3	CEE Tier 3 Clothes Washer - MEF 2.4 and WF 4.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	18	11	\$268	99%	33%	\$2.30	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - ENERGY STAR	ENERGY STAR Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	12	11	\$152	99%	33%	\$1.92	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2016	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Standard Clothes Washer - MEF 1.48 and WF 9.5 (Electric DHW & Dryer)	Savings Per Building	New	6	11	\$70	99%	33%	\$1.65	0.00
Gas	Single Family	Water Heat Le 55 Gal	Clothes Washer - Federal Standard 2018	Federal Standard 2018 Clothes Washer - MEF 2.0 and WF 6.0 (Electric DHW & Dryer)	Federal Standard 2016 Clothes Washer - MEF 1.72 and WF 8.0 (Electric DHW & Dryer)	Savings Per Building	New	5	11	\$81	99%	33%	\$2.23	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	3	11	\$161	71%	30%	\$8.26	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - ENERGY STAR	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$7	71%	30%	\$1.12	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	3	11	\$309	71%	30%	\$14.27	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Enhanced Efficiency	Enhanced Efficiency Dishwasher - 250 kWh/yr and 4.25 gal/cycle	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Savings Per Building	New	1	11	\$155	71%	30%	\$17.92	0.00
Gas	Single Family	Water Heat Le 55 Gal	Dishwasher - Federal Standard 2014	Federal Standard 2014 Dishwasher - 307 kWh/yr and 5.0 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Savings Per Building	New	2	11	\$154	71%	30%	\$11.82	0.00

Table F.1. Residential Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Single Family	Water Heat Le 55 Gal	Drain Water Heat Recovery (GFX)	Gravity Film Heat Exchanger	No Heat Exchanger	Savings Per Building	New	24	40	\$935	60%	**%	\$3.45	0.00
Gas	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 1	Tier 1 Aerator - 1.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	5	10	\$2	75%	65%	\$0.06	2,691
Gas	Single Family	Water Heat Le 55 Gal	Faucet Aerator - Tier 2	Tier 2 Aerator - 0.5 GPM	Federal Standard 1994 Aerator - 2.2 GPM	Savings Per Building	New	13	10	\$3	75%	95%	\$0.04	9,554
Gas	Single Family	Water Heat Le 55 Gal	Low-Flow Showerhead	Low-Flow Showerhead - 2.0 GPM	Federal Standard 1994 Showerhead - 2.5 GPM	Savings Per Building	New	19	10	\$15	100%	65%	\$0.13	12,853
Gas	Single Family	Water Heat Le 55 Gal	Pipe Insulation - Water Heater	R-4 Pipe Wrap	No Pipe Insulation	Savings Per Building	New	2	15	\$3	100%	0%	\$0.21	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	66	12	\$150	19%	90%	\$0.34	413
Gas	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	41	12	\$44	19%	90%	\$0.16	430
Gas	Grocery	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	133	12	\$799	19%	85%	\$0.90	0.00
Gas	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	14	12	\$132	19%	70%	\$1.39	0.00
Gas	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	12	12	\$83	19%	55%	\$1.01	0.00
Gas	Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	33	12	\$326	14%	75%	\$1.48	0.00
Gas	Grocery	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	66	12	\$150	19%	90%	\$0.34	40
Gas	Grocery	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	41	12	\$44	19%	90%	\$0.16	41
Gas	Grocery	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	133	12	\$799	19%	85%	\$0.90	0.00
Gas	Grocery	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	14	12	\$132	19%	70%	\$1.39	0.00
Gas	Grocery	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	12	12	\$83	19%	55%	\$1.01	0.00
Gas	Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	33	12	\$326	14%	75%	\$1.48	0.00
Gas	Grocery	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	66	20	\$270	75%	80%	\$0.46	725
Gas	Grocery	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	27	10	\$471	75%	20%	\$2.88	0.00
Gas	Grocery	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	10	10	\$138	75%	65%	\$2.33	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	181	20	\$1,734	100%	N/A	\$1.07	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	110	20	\$990	100%	N/A	\$1.01	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	158	20	\$1,486	100%	N/A	\$1.05	0.00
Gas	Grocery	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	120	10	\$2,058	75%	85%	\$2.91	0.00
Gas	Grocery	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	360	15	\$11,757	1.0%	70%	\$4.26	0.00
Gas	Grocery	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	180	5	\$312	75%	75%	\$0.51	2,333
Gas	Grocery	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	180	14	\$5,080	5.0%	95%	\$3.84	0.00
Gas	Grocery	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	54	12	\$5,450	10%	85%	\$15.12	0.00
Gas	Grocery	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	120	12	\$76	10%	60%	\$0.10	142

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	236	25	\$2,036	45%	65%	\$0.88	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	29	25	\$980	25%	85%	\$3.33	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	289	25	\$3,635	15%	85%	\$1.28	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	53	25	\$1,121	15%	95%	\$2.12	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	382	25	\$8,938	10%	45%	\$2.38	0.00
Gas	Grocery	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	108	20	\$779	10%	95%	\$0.81	0.00
Gas	Grocery	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	150	7	\$2,456	90%	95%	\$3.62	0.00
Gas	Grocery	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	60	3	\$78	95%	50%	\$0.59	0.00
Gas	Grocery	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	10	10	\$138	95%	65%	\$2.33	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	181	20	\$1,734	100%	N/A	\$1.07	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	110	20	\$990	100%	N/A	\$1.01	0.00
Gas	Grocery	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	158	20	\$1,486	100%	N/A	\$1.05	0.00
Gas	Grocery	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	117	10	\$2,058	95%	85%	\$2.97	0.00
Gas	Grocery	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	67	7	\$2,862	95%	95%	\$9.37	0.00
Gas	Grocery	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	176	5	\$312	25%	25%	\$0.52	24
Gas	Grocery	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	176	14	\$5,080	5.0%	95%	\$3.92	0.00
Gas	Grocery	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	52	12	\$5,450	10%	85%	\$15.46	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	29	25	\$980	75%	85%	\$3.40	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	52	25	\$1,121	15%	95%	\$2.17	0.00
Gas	Grocery	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	142	25	\$934	95%	85%	\$0.67	179
Gas	Grocery	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	105	20	\$779	25%	95%	\$0.83	0.00
Gas	Grocery	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	368	15	\$11,757	1.0%	70%	\$4.18	0.00
Gas	Grocery	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	184	5	\$312	75%	75%	\$0.50	7,149
Gas	Grocery	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	30	18	\$928	45%	85%	\$3.58	0.00
Gas	Grocery	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	184	14	\$5,080	5.0%	95%	\$3.76	0.00
Gas	Grocery	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	55	12	\$5,450	10%	85%	\$14.82	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	77	20	\$627	1.7%	N/A	\$0.91	0.00
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	26	20	\$193	1.7%	N/A	\$0.81	0.00
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	52	20	\$402	1.7%	N/A	\$0.86	0.00
Gas	Grocery	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	122	12	\$76	10%	60%	\$0.09	439
Gas	Grocery	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	241	25	\$2,036	45%	65%	\$0.86	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	30	25	\$980	25%	85%	\$3.26	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	36	20	\$521	45%	60%	\$1.59	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	22	20	\$91	45%	85%	\$0.47	501
Gas	Grocery	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	294	25	\$3,635	15%	85%	\$1.26	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	54	25	\$1,121	15%	95%	\$2.08	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	390	25	\$8,938	10%	45%	\$2.33	0.00
Gas	Grocery	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	153	7	\$2,456	90%	95%	\$3.55	0.00
Gas	Grocery	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	61	3	\$87	95%	50%	\$0.65	0.00
Gas	Grocery	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	69	7	\$2,862	95%	95%	\$9.14	0.00
Gas	Grocery	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	180	5	\$312	25%	25%	\$0.50	76
Gas	Grocery	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	180	14	\$5,080	5.0%	95%	\$3.83	0.00
Gas	Grocery	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	54	12	\$5,450	10%	85%	\$15.08	0.00
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	77	20	\$627	1.7%	N/A	\$0.91	0.00
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	26	20	\$193	1.7%	N/A	\$0.81	0.00
Gas	Grocery	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	52	20	\$402	1.7%	N/A	\$0.86	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	30	25	\$980	75%	85%	\$3.32	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	21	20	\$91	45%	85%	\$0.47	39
Gas	Grocery	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	53	25	\$1,121	15%	95%	\$2.12	0.00
Gas	Grocery	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	146	25	\$934	95%	85%	\$0.65	554

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	6	10	\$1,074	75%	95%	\$30.34	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$39	45%	35%	\$9.47	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$49	40%	95%	\$1.93	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$49	40%	95%	\$2.11	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	1	12	\$32	75%	75%	\$4.00	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	24	25	\$999	2.5%	95%	\$4.23	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	37	20	\$779	10%	95%	\$2.31	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	4	9	\$0.38	95%	75%	\$0.02	77
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.38	95%	50%	\$0.04	21
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.72	9	\$7	95%	25%	\$1.96	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	34	4	\$204	95%	75%	\$2.10	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	3	10	\$117	75%	95%	\$6.66	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	13	10	\$2,730	55%	95%	\$33.81	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	34	13	\$1,184	100%	N/A	\$4.87	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	45	13	\$1,810	100%	N/A	\$5.68	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	25	13	\$789	100%	N/A	\$4.43	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	17	13	\$507	100%	N/A	\$4.07	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	5	10	\$1,074	75%	95%	\$30.48	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$39	45%	35%	\$9.47	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$47	40%	95%	\$1.93	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$47	40%	95%	\$2.11	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	23	25	\$800	2.5%	95%	\$3.40	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	37	20	\$779	25%	95%	\$2.32	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	4	9	\$0.38	95%	75%	\$0.02	7
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.38	95%	50%	\$0.04	1
Gas	Grocery	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	34	4	\$204	95%	75%	\$2.10	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	2	10	\$117	75%	95%	\$6.69	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	13	10	\$2,730	55%	95%	\$33.97	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	34	13	\$1,184	100%	N/A	\$4.87	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	45	13	\$1,810	100%	N/A	\$5.68	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	25	13	\$789	100%	N/A	\$4.43	0.00
Gas	Grocery	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	17	13	\$507	100%	N/A	\$4.07	0.00
Gas	Grocery	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	6	10	\$1,074	50%	95%	\$30.14	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$39	75%	35%	\$9.47	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$49	50%	95%	\$1.93	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	3	12	\$49	50%	95%	\$2.11	0.00
Gas	Grocery	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	1	12	\$32	75%	75%	\$3.98	0.00
Gas	Grocery	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	24	25	\$999	2.5%	95%	\$4.20	0.00
Gas	Grocery	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	38	20	\$779	10%	95%	\$2.29	0.00
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	4	9	\$0.38	95%	75%	\$0.02	127
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.38	95%	50%	\$0.04	35

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.72	9	\$7	95%	25%	\$1.95	0.00
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	34	4	\$204	95%	75%	\$2.10	0.00
Gas	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	3	10	\$117	75%	95%	\$6.62	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	13	10	\$2,730	55%	95%	\$33.58	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	41	13	\$906	100%	N/A	\$3.14	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	13	13	\$124	100%	N/A	\$1.29	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	4	13	\$40	100%	N/A	\$1.40	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	5	13	\$40	100%	N/A	\$1.14	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	33	13	\$426	100%	N/A	\$1.82	0.00
Gas	Grocery	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	6	10	\$1,074	50%	95%	\$30.22	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$39	75%	35%	\$9.47	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$47	50%	95%	\$1.93	0.00
Gas	Grocery	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	3	12	\$47	50%	95%	\$2.11	0.00
Gas	Grocery	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	24	25	\$800	2.5%	95%	\$3.37	0.00
Gas	Grocery	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	38	20	\$779	25%	95%	\$2.30	0.00
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	4	9	\$0.38	95%	75%	\$0.02	12
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.38	95%	50%	\$0.04	3
Gas	Grocery	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	34	4	\$204	95%	75%	\$2.10	0.00
Gas	Grocery	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	3	10	\$117	75%	95%	\$6.64	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	13	10	\$2,730	55%	95%	\$33.68	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	41	13	\$906	100%	N/A	\$3.14	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	13	13	\$124	100%	N/A	\$1.29	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	4	13	\$40	100%	N/A	\$1.40	-0.0005256
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	5	13	\$40	100%	N/A	\$1.14	0.00
Gas	Grocery	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	33	13	\$426	100%	N/A	\$1.82	0.00
Gas	Health	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	13	12	\$30	7.0%	90%	\$0.34	430
Gas	Health	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	8	12	\$9	7.0%	60%	\$0.17	298
Gas	Health	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	27	12	\$161	7.0%	85%	\$0.89	0.00
Gas	Health	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	1	12	\$9	7.0%	70%	\$1.29	0.00
Gas	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	2	12	\$16	7.0%	55%	\$0.98	0.00
Gas	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	6	12	\$65	11%	75%	\$1.46	0.00
Gas	Health	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	13	12	\$30	7.0%	90%	\$0.34	41
Gas	Health	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	8	12	\$9	7.0%	60%	\$0.17	28
Gas	Health	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	27	12	\$161	7.0%	85%	\$0.89	0.00
Gas	Health	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	1	12	\$9	7.0%	70%	\$1.29	0.00
Gas	Health	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	2	12	\$16	7.0%	55%	\$0.98	0.00
Gas	Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	6	12	\$65	11%	75%	\$1.46	0.00
Gas	Health	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	276	15	\$877	5.0%	95%	\$0.41	1,172
Gas	Health	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	507	20	\$1,634	75%	80%	\$0.36	25,807
Gas	Health	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	77	10	\$1,314	75%	20%	\$2.89	0.00
Gas	Health	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	28	10	\$385	75%	65%	\$2.33	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	1,390	20	\$10,487	100%	N/A	\$0.85	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	847	20	\$5,992	100%	N/A	\$0.79	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	1,217	20	\$8,990	100%	N/A	\$0.83	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	922	10	\$2,060	75%	85%	\$0.38	48,210
Gas	Health	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,768	15	\$71,102	15%	70%	\$3.36	0.00
Gas	Health	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,384	5	\$1,461	75%	75%	\$0.31	83,141
Gas	Health	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,384	14	\$30,721	5.0%	95%	\$3.02	0.00
Gas	Health	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	415	12	\$5,449	2.5%	85%	\$1.97	0.00
Gas	Health	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	922	12	\$605	10%	60%	\$0.10	5,075
Gas	Health	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,073	25	\$9,580	45%	65%	\$0.91	0.00
Gas	Health	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	230	25	\$4,607	25%	85%	\$2.04	0.00
Gas	Health	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,218	25	\$17,099	15%	85%	\$0.79	0.00
Gas	Health	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	413	25	\$5,276	15%	95%	\$1.30	0.00
Gas	Health	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,934	25	\$42,039	10%	45%	\$1.46	0.00
Gas	Health	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	830	20	\$4,712	10%	95%	\$0.64	7,357
Gas	Health	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,153	7	\$14,852	90%	95%	\$2.86	0.00
Gas	Health	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	461	3	\$474	95%	50%	\$0.47	16,641
Gas	Health	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	28	10	\$385	95%	65%	\$2.33	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	1,390	20	\$10,487	100%	N/A	\$0.85	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	847	20	\$5,992	100%	N/A	\$0.79	0.00
Gas	Health	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	1,217	20	\$8,990	100%	N/A	\$0.83	0.00
Gas	Health	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	902	10	\$2,060	95%	85%	\$0.39	5,876
Gas	Health	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	519	7	\$17,307	95%	95%	\$7.38	0.00
Gas	Health	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,353	5	\$1,461	25%	25%	\$0.32	879
Gas	Health	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,353	14	\$30,721	5.0%	95%	\$3.09	0.00
Gas	Health	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	406	12	\$5,449	2.5%	85%	\$2.01	0.00
Gas	Health	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	224	25	\$4,607	75%	85%	\$2.09	0.00
Gas	Health	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	403	25	\$5,276	15%	95%	\$1.33	0.00
Gas	Health	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,093	25	\$4,394	95%	85%	\$0.41	6,379

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	812	20	\$4,712	25%	95%	\$0.65	961
Gas	Health	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	282	15	\$877	5.0%	95%	\$0.41	5,567
Gas	Health	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	2,823	15	\$71,102	15%	70%	\$3.29	0.00
Gas	Health	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,411	5	\$1,461	75%	75%	\$0.30	394,689
Gas	Health	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	235	18	\$5,613	45%	85%	\$2.82	0.00
Gas	Health	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,411	14	\$30,721	5.0%	95%	\$2.96	0.00
Gas	Health	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	423	12	\$5,449	2.5%	85%	\$1.93	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	591	20	\$3,796	1.7%	N/A	\$0.72	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	205	20	\$1,171	1.7%	N/A	\$0.64	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	402	20	\$2,434	1.7%	N/A	\$0.68	0.00
Gas	Health	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	941	12	\$605	10%	60%	\$0.10	24,290
Gas	Health	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,095	25	\$9,580	45%	65%	\$0.89	0.00
Gas	Health	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	234	25	\$4,607	25%	85%	\$2.00	0.00
Gas	Health	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	282	20	\$694	45%	60%	\$0.28	32,595
Gas	Health	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	169	20	\$123	45%	85%	\$0.08	28,066
Gas	Health	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,263	25	\$17,099	15%	85%	\$0.77	109,237
Gas	Health	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	421	25	\$5,276	15%	95%	\$1.28	0.00
Gas	Health	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	2,992	25	\$42,039	10%	45%	\$1.43	0.00
Gas	Health	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,176	7	\$14,852	90%	95%	\$2.80	0.00
Gas	Health	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	470	3	\$526	95%	50%	\$0.51	88,173
Gas	Health	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	532	7	\$17,307	95%	95%	\$7.20	0.00
Gas	Health	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,387	5	\$1,461	25%	25%	\$0.31	4,217
Gas	Health	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,387	14	\$30,721	5.0%	95%	\$3.02	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	416	12	\$5,449	2.5%	85%	\$1.97	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	591	20	\$3,796	1.7%	N/A	\$0.72	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	205	20	\$1,171	1.7%	N/A	\$0.64	0.00
Gas	Health	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	402	20	\$2,434	1.7%	N/A	\$0.68	0.00
Gas	Health	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	230	25	\$4,607	75%	85%	\$2.04	0.00
Gas	Health	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	166	20	\$123	45%	85%	\$0.08	2,185
Gas	Health	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	413	25	\$5,276	15%	95%	\$1.30	0.00
Gas	Health	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,121	25	\$4,394	95%	85%	\$0.40	30,571
Gas	Health	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	4	9	\$44	25%	95%	\$1.64	0.00
Gas	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	2	14	\$18	5.0%	95%	\$1.09	0.00
Gas	Health	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	420	10	\$6,497	55%	95%	\$2.63	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.35	12	\$23	75%	35%	\$9.93	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	6	12	\$81	10%	95%	\$1.94	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	5	12	\$81	10%	95%	\$2.12	0.00
Gas	Health	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	84	12	\$507	75%	75%	\$0.91	0.00
Gas	Health	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,680	25	\$16,000	2.5%	95%	\$0.97	0.00
Gas	Health	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	2,647	20	\$4,712	10%	95%	\$0.20	29,115
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	324	9	\$2	95%	75%	\$0.00	33,593
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	133	9	\$2	95%	50%	\$0.00	9,221
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	50	9	\$25	95%	25%	\$0.09	1,738
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	13	4	\$81	95%	95%	\$2.10	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	5	10	\$9	95%	85%	\$0.27	695
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	4	10	\$23	95%	25%	\$0.83	0.00
Gas	Health	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	210	10	\$392	75%	85%	\$0.32	19,448
Gas	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	958	10	\$102	2.5%	95%	\$0.02	3,575
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Gal - Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	2,424	13	\$18,952	100%	N/A	\$1.11	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	3,173	13	\$28,967	100%	N/A	\$1.30	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	1,775	13	\$12,634	100%	N/A	\$1.01	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	1,243	13	\$8,122	100%	N/A	\$0.93	0.00
Gas	Health	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	4	9	\$44	25%	95%	\$1.64	0.00
Gas	Health	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	2	14	\$18	5.0%	95%	\$1.09	0.00
Gas	Health	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	418	10	\$6,497	55%	95%	\$2.64	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.35	12	\$23	75%	35%	\$9.93	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	6	12	\$81	10%	95%	\$1.95	0.00
Gas	Health	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	5	12	\$79	10%	95%	\$2.07	0.00
Gas	Health	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,672	25	\$12,798	2.5%	95%	\$0.78	0.00
Gas	Health	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	2,634	20	\$4,712	25%	95%	\$0.20	3,806
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	323	9	\$2	95%	75%	\$0.00	3,145
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	133	9	\$2	95%	50%	\$0.00	863
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	13	4	\$81	95%	95%	\$2.10	0.00
Gas	Health	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	5	10	\$9	95%	85%	\$0.27	65
Gas	Health	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	209	10	\$392	75%	85%	\$0.32	1,821

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	953	10	\$102	2.5%	95%	\$0.02	334
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	2,424	13	\$18,952	100%	N/A	\$1.11	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	3,173	13	\$28,967	100%	N/A	\$1.30	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	1,775	13	\$12,634	100%	N/A	\$1.01	0.00
Gas	Health	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	1,243	13	\$8,122	100%	N/A	\$0.93	0.00
Gas	Health	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	4	9	\$44	25%	95%	\$1.64	0.00
Gas	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	2	14	\$18	5.0%	95%	\$1.09	0.00
Gas	Health	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	423	10	\$6,497	75%	95%	\$2.61	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.35	12	\$23	75%	35%	\$9.93	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	6	12	\$81	10%	95%	\$1.94	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	5	12	\$81	10%	95%	\$2.12	0.00
Gas	Health	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	84	12	\$507	75%	75%	\$0.90	0.00
Gas	Health	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,692	25	\$16,000	2.5%	95%	\$0.96	0.00
Gas	Health	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	2,665	20	\$4,712	10%	95%	\$0.20	38,366
Gas	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	326	9	\$2	95%	75%	\$0.00	44,266
Gas	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	134	9	\$2	95%	50%	\$0.00	12,151
Gas	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	50	9	\$25	95%	25%	\$0.09	2,291
Gas	Health	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	13	4	\$81	95%	95%	\$2.10	0.00
Gas	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	5	10	\$9	95%	85%	\$0.27	909
Gas	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	4	10	\$23	95%	25%	\$0.83	0.00
Gas	Health	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	211	10	\$392	75%	85%	\$0.32	25,628

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	964	10	\$102	2.5%	95%	\$0.02	4,711
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	2,872	13	\$14,510	100%	N/A	\$0.72	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	958	13	\$1,983	100%	N/A	\$0.30	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	288	13	\$647	100%	N/A	\$0.32	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	354	13	\$647	100%	N/A	\$0.26	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	2,328	13	\$6,827	100%	N/A	\$0.42	256,900
Gas	Health	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	4	9	\$44	25%	95%	\$1.64	0.00
Gas	Health	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	2	14	\$18	5.0%	95%	\$1.09	0.00
Gas	Health	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	421	10	\$6,497	75%	95%	\$2.62	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.35	12	\$23	75%	35%	\$9.93	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	6	12	\$81	10%	95%	\$1.95	0.00
Gas	Health	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	5	12	\$79	10%	95%	\$2.07	0.00
Gas	Health	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,687	25	\$12,798	2.5%	95%	\$0.77	0.00
Gas	Health	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	2,657	20	\$4,712	25%	95%	\$0.20	4,865
Gas	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	325	9	\$2	95%	75%	\$0.00	3,986
Gas	Health	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	134	9	\$2	95%	50%	\$0.00	1,094
Gas	Health	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	13	4	\$81	95%	95%	\$2.10	0.00
Gas	Health	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	5	10	\$9	95%	85%	\$0.27	82
Gas	Health	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	210	10	\$392	75%	85%	\$0.32	2,308

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Health	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	961	10	\$102	2.5%	95%	\$0.02	424
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	2,872	13	\$14,510	100%	N/A	\$0.72	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	958	13	\$1,983	100%	N/A	\$0.30	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	288	13	\$647	100%	N/A	\$0.32	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	354	13	\$647	100%	N/A	\$0.26	0.00
Gas	Health	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	2,328	13	\$6,827	100%	N/A	\$0.42	27,558
Gas	Large Office	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	922	15	\$4,728	75%	95%	\$0.67	8,997
Gas	Large Office	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	1,014	20	\$5,287	75%	80%	\$0.59	6,705
Gas	Large Office	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	211	10	\$3,585	75%	20%	\$2.88	0.00
Gas	Large Office	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	76	10	\$1,051	75%	65%	\$2.32	0.00
Gas	Large Office	Space Heat Boiler	Boiler = 300 and = 2,500 kBtuh - High Efficiency	High Efficiency - Thermal Efficiency Et = 85%	Standard Efficiency - Thermal Efficiency Et = 75%	Per Building	Existing	2,219	20	\$5,734	100%	N/A	\$0.29	0.00
Gas	Large Office	Space Heat Boiler	Boiler = 300 and = 2,500 kBtuh - Premium Efficiency	High Efficiency - Thermal Efficiency Et = 95%	Standard Efficiency - Thermal Efficiency Et = 75%	Per Building	Existing	3,971	20	\$11,468	100%	N/A	\$0.32	17,615
Gas	Large Office	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	1,844	10	\$4,122	75%	85%	\$0.38	14,775
Gas	Large Office	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	5,532	15	\$29,976	15%	70%	\$5.44	0.00
Gas	Large Office	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	2,766	5	\$4,728	75%	75%	\$0.50	25,514
Gas	Large Office	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	2,766	14	\$99,366	5.0%	95%	\$4.89	0.00
Gas	Large Office	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,844	12	\$2,458	10%	60%	\$0.20	1,557
Gas	Large Office	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,146	25	\$13,458	45%	65%	\$0.64	7,039
Gas	Large Office	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	459	25	\$6,483	25%	85%	\$1.44	0.00
Gas	Large Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,434	25	\$24,026	15%	85%	\$0.55	6,540
Gas	Large Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	825	25	\$7,413	15%	95%	\$0.91	0.00
Gas	Large Office	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	5,864	25	\$59,067	10%	45%	\$1.03	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Office	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,305	7	\$48,037	90%	95%	\$4.62	0.00
Gas	Large Office	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	922	3	\$1,528	95%	50%	\$0.76	0.00
Gas	Large Office	Space Heat Boiler	Boiler - Pipe Insulation	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	Per Building	New	76	10	\$1,051	95%	65%	\$2.32	0.00
Gas	Large Office	Space Heat Boiler	Boiler = 300 and = 2,500 kBtuh - High Efficiency	High Efficiency - Thermal Efficiency Et = 85%	Standard Efficiency - Thermal Efficiency Et = 75%	Per Building	New	2,219	20	\$5,734	100%	N/A	\$0.29	0.00
Gas	Large Office	Space Heat Boiler	Boiler = 300 and = 2,500 kBtuh - Premium Efficiency	High Efficiency - Thermal Efficiency Et = 95%	Standard Efficiency - Thermal Efficiency Et = 75%	Per Building	New	3,971	20	\$11,468	100%	N/A	\$0.32	2,494
Gas	Large Office	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	1,776	10	\$4,122	95%	85%	\$0.39	1,720
Gas	Large Office	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,023	7	\$55,981	95%	95%	\$12.13	0.00
Gas	Large Office	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	2,665	5	\$4,728	0.0%	25%	\$0.52	0.00
Gas	Large Office	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	2,665	14	\$99,366	5.0%	95%	\$5.08	0.00
Gas	Large Office	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	442	25	\$6,483	75%	85%	\$1.49	0.00
Gas	Large Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	795	25	\$7,413	15%	95%	\$0.95	0.00
Gas	Large Office	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,153	25	\$6,180	95%	85%	\$0.29	1,867
Gas	Large Office	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	948	15	\$4,728	75%	95%	\$0.65	43,698
Gas	Large Office	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	5,692	15	\$29,976	15%	70%	\$5.28	0.00
Gas	Large Office	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	2,846	5	\$4,728	75%	75%	\$0.48	123,917
Gas	Large Office	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	474	18	\$18,156	45%	85%	\$4.53	0.00
Gas	Large Office	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	2,846	14	\$99,366	5.0%	95%	\$4.76	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	1,193	20	\$12,277	12%	N/A	\$1.15	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	414	20	\$3,790	12%	N/A	\$1.02	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	812	20	\$7,875	12%	N/A	\$1.09	0.00
Gas	Large Office	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,897	12	\$2,458	10%	60%	\$0.19	7,616
Gas	Large Office	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,208	25	\$13,458	45%	65%	\$0.62	36,223
Gas	Large Office	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	472	25	\$6,483	25%	85%	\$1.40	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Office	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	569	20	\$5,287	45%	60%	\$1.04	8,963
Gas	Large Office	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	341	20	\$938	45%	85%	\$0.31	8,687
Gas	Large Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	4,562	25	\$24,026	15%	85%	\$0.54	33,652
Gas	Large Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	849	25	\$7,413	15%	95%	\$0.89	0.00
Gas	Large Office	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	6,033	25	\$59,067	10%	45%	\$1.00	0.00
Gas	Large Office	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	2,371	7	\$48,037	90%	95%	\$4.49	0.00
Gas	Large Office	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	948	3	\$1,702	95%	50%	\$0.82	0.00
Gas	Large Office	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	1,074	7	\$55,981	95%	95%	\$11.56	0.00
Gas	Large Office	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	2,797	5	\$4,728	0.0%	25%	\$0.49	0.00
Gas	Large Office	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	2,797	14	\$99,366	5.0%	95%	\$4.84	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	1,193	20	\$12,277	12%	N/A	\$1.15	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	414	20	\$3,790	12%	N/A	\$1.02	0.00
Gas	Large Office	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	812	20	\$7,875	12%	N/A	\$1.09	0.00
Gas	Large Office	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	464	25	\$6,483	75%	85%	\$1.42	0.00
Gas	Large Office	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	335	20	\$938	45%	85%	\$0.31	687
Gas	Large Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	834	25	\$7,413	15%	95%	\$0.90	0.00
Gas	Large Office	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	2,260	25	\$6,180	95%	85%	\$0.28	9,701
Gas	Large Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	32	10	\$21,015	55%	80%	\$109.01	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$37	95%	35%	\$9.30	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	6	12	\$302	75%	75%	\$6.93	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	131	25	\$9,403	2.5%	95%	\$7.31	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	25	9	\$7	95%	75%	\$0.05	368
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	10	9	\$0.00	95%	50%	\$0.00	101
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	3	9	\$22	95%	25%	\$1.06	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	9	10	\$22	95%	85%	\$0.39	162

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	7	10	\$60	95%	25%	\$1.29	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	16	10	\$385	75%	85%	\$4.00	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	188	13	\$11,128	100%	N/A	\$8.40	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	247	13	\$17,013	100%	N/A	\$9.81	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	138	13	\$7,421	100%	N/A	\$7.65	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	96	13	\$4,765	100%	N/A	\$7.01	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	32	10	\$21,015	55%	80%	\$109.51	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$37	95%	35%	\$9.30	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	130	25	\$7,519	2.5%	95%	\$5.87	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	25	9	\$7	95%	75%	\$0.06	34
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	10	9	\$0.00	95%	50%	\$0.00	9
Gas	Large Office	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	9	10	\$22	95%	85%	\$0.39	15
Gas	Large Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	16	10	\$385	75%	85%	\$4.02	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	188	13	\$11,128	100%	N/A	\$8.40	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	247	13	\$17,013	100%	N/A	\$9.81	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	138	13	\$7,421	100%	N/A	\$7.65	0.00
Gas	Large Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	96	13	\$4,765	100%	N/A	\$7.01	0.00
Gas	Large Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	32	10	\$21,015	75%	80%	\$108.28	0.00
Gas	Large Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$37	75%	35%	\$9.30	0.00
Gas	Large Office	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	6	12	\$302	75%	75%	\$6.89	0.00
Gas	Large Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	131	25	\$9,403	2.5%	95%	\$7.26	0.00
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	25	9	\$7	95%	75%	\$0.05	606

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	10	9	\$0.00	95%	50%	\$0.00	166
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	3	9	\$22	95%	25%	\$1.05	0.00
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	9	10	\$22	95%	85%	\$0.39	265
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	7	10	\$60	95%	25%	\$1.29	0.00
Gas	Large Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	16	10	\$385	75%	85%	\$3.98	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	223	13	\$8,525	100%	N/A	\$5.43	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	74	13	\$1,165	100%	N/A	\$2.22	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	22	13	\$378	100%	N/A	\$2.40	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	27	13	\$378	100%	N/A	\$1.95	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	181	13	\$4,009	100%	N/A	\$3.15	0.00
Gas	Large Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	32	10	\$21,015	75%	80%	\$108.58	0.00
Gas	Large Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$37	75%	35%	\$9.30	0.00
Gas	Large Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	131	25	\$7,519	2.5%	95%	\$5.82	0.00
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	25	9	\$7	95%	75%	\$0.05	58
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	10	9	\$0.00	95%	50%	\$0.00	16
Gas	Large Office	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	9	10	\$22	95%	85%	\$0.39	25
Gas	Large Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	16	10	\$385	75%	85%	\$3.99	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	223	13	\$8,525	100%	N/A	\$5.43	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	74	13	\$1,165	100%	N/A	\$2.22	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	22	13	\$378	100%	N/A	\$2.40	-0.0024607
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	27	13	\$378	100%	N/A	\$1.95	0.00
Gas	Large Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	181	13	\$4,009	100%	N/A	\$3.15	0.00
Gas	Large Retail	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	6	12	\$13	7.0%	90%	\$0.31	192

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	2	12	\$0.00	7.0%	90%	\$0.00	100
Gas	Large Retail	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	6	12	\$40	7.0%	85%	\$0.94	0.00
Gas	Large Retail	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	3	12	\$35	7.0%	70%	\$1.45	0.00
Gas	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	1	12	\$8	7.0%	55%	\$1.13	0.00
Gas	Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	1	12	\$13	11%	75%	\$1.32	0.00
Gas	Large Retail	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	6	12	\$13	7.0%	90%	\$0.31	18
Gas	Large Retail	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	2	12	\$0.00	7.0%	90%	\$0.00	9
Gas	Large Retail	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	6	12	\$40	7.0%	85%	\$0.94	0.00
Gas	Large Retail	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	3	12	\$35	7.0%	70%	\$1.45	0.00
Gas	Large Retail	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	1	12	\$8	7.0%	55%	\$1.13	0.00
Gas	Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	1	12	\$13	11%	75%	\$1.32	0.00
Gas	Large Retail	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	200	15	\$594	25%	95%	\$0.39	0.00
Gas	Large Retail	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	551	20	\$3,122	75%	80%	\$0.64	0.00
Gas	Large Retail	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	125	10	\$2,121	75%	20%	\$2.88	0.00
Gas	Large Retail	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	45	10	\$625	75%	65%	\$2.33	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	1,510	20	\$20,030	100%	N/A	\$1.49	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	920	20	\$11,444	100%	N/A	\$1.39	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	1,322	20	\$17,167	100%	N/A	\$1.46	0.00
Gas	Large Retail	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	1,002	10	\$4,118	75%	85%	\$0.70	0.00
Gas	Large Retail	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,007	15	\$35,799	15%	70%	\$5.90	0.00
Gas	Large Retail	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,503	5	\$2,791	75%	75%	\$0.54	0.00
Gas	Large Retail	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,503	14	\$58,675	5.0%	95%	\$5.32	0.00
Gas	Large Retail	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	451	12	\$5,454	2.5%	85%	\$1.82	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,002	12	\$1,250	10%	60%	\$0.19	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,972	25	\$13,396	45%	65%	\$0.69	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	249	25	\$6,441	25%	85%	\$2.63	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,410	25	\$23,907	15%	85%	\$1.01	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	448	25	\$7,375	15%	95%	\$1.67	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	3,187	25	\$58,778	10%	45%	\$1.88	0.00
Gas	Large Retail	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	902	20	\$9,001	10%	95%	\$1.12	0.00
Gas	Large Retail	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,253	7	\$28,366	90%	95%	\$5.02	0.00
Gas	Large Retail	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	501	3	\$902	95%	50%	\$0.82	0.00
Gas	Large Retail	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	45	10	\$625	95%	65%	\$2.33	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	1,510	20	\$20,030	100%	N/A	\$1.49	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	920	20	\$11,444	100%	N/A	\$1.39	0.00
Gas	Large Retail	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	1,322	20	\$17,167	100%	N/A	\$1.46	0.00
Gas	Large Retail	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	980	10	\$4,118	95%	85%	\$0.71	0.00
Gas	Large Retail	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	564	7	\$33,056	95%	95%	\$12.98	0.00
Gas	Large Retail	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,470	5	\$2,791	25%	25%	\$0.55	0.00
Gas	Large Retail	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,470	14	\$58,675	5.0%	95%	\$5.44	0.00
Gas	Large Retail	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	441	12	\$5,454	2.5%	85%	\$1.86	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	244	25	\$6,441	75%	85%	\$2.68	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	438	25	\$7,375	15%	95%	\$1.71	0.00
Gas	Large Retail	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,188	25	\$6,146	95%	85%	\$0.53	0.00
Gas	Large Retail	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	882	20	\$9,001	25%	95%	\$1.14	0.00
Gas	Large Retail	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	204	15	\$594	25%	95%	\$0.38	37,887
Gas	Large Retail	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	3,067	15	\$35,799	15%	70%	\$5.79	0.00
Gas	Large Retail	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	1,533	5	\$2,791	75%	75%	\$0.53	734,323
Gas	Large Retail	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	255	18	\$10,721	45%	85%	\$4.96	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	1,533	14	\$58,675	5.0%	95%	\$5.21	0.00
Gas	Large Retail	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	460	12	\$5,454	2.5%	85%	\$1.78	6,505
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	642	20	\$7,250	12%	N/A	\$1.27	0.00
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	223	20	\$2,238	12%	N/A	\$1.12	0.00
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	437	20	\$4,650	12%	N/A	\$1.19	0.00
Gas	Large Retail	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	1,022	12	\$1,250	10%	60%	\$0.18	45,040
Gas	Large Retail	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,011	25	\$13,396	45%	65%	\$0.68	388,618
Gas	Large Retail	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	254	25	\$6,441	25%	85%	\$2.57	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	306	20	\$6,088	45%	60%	\$2.23	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	184	20	\$1,067	45%	85%	\$0.65	46,817
Gas	Large Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	2,458	25	\$23,907	15%	85%	\$0.99	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	457	25	\$7,375	15%	95%	\$1.64	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	3,251	25	\$58,778	10%	45%	\$1.84	0.00
Gas	Large Retail	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	1,278	7	\$28,366	90%	95%	\$4.92	0.00
Gas	Large Retail	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	511	3	\$1,005	95%	50%	\$0.90	0.00
Gas	Large Retail	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	578	7	\$33,056	95%	95%	\$12.66	0.00
Gas	Large Retail	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	1,507	5	\$2,791	25%	25%	\$0.54	7,893
Gas	Large Retail	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	1,507	14	\$58,675	5.0%	95%	\$5.30	0.00
Gas	Large Retail	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	452	12	\$5,454	2.5%	85%	\$1.81	651
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	642	20	\$7,250	12%	N/A	\$1.27	0.00
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	223	20	\$2,238	12%	N/A	\$1.12	0.00
Gas	Large Retail	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	437	20	\$4,650	12%	N/A	\$1.19	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	250	25	\$6,441	75%	85%	\$2.62	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	180	20	\$1,067	45%	85%	\$0.66	4,025
Gas	Large Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	449	25	\$7,375	15%	95%	\$1.67	0.00
Gas	Large Retail	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	1,217	25	\$6,146	95%	85%	\$0.51	56,830
Gas	Large Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	13	10	\$12,409	75%	95%	\$161.04	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$67	75%	35%	\$9.25	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	1	12	\$13	20%	95%	\$1.87	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.98	12	\$13	20%	95%	\$2.04	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	2	12	\$142	75%	75%	\$8.19	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	52	25	\$4,400	2.5%	95%	\$8.56	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	82	20	\$9,001	10%	95%	\$12.25	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	10	9	\$0.00	95%	75%	\$0.00	999
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	4	9	\$0.00	95%	50%	\$0.00	274
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$26	95%	25%	\$3.13	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	1	4	\$8	95%	95%	\$1.72	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	6	10	\$393	75%	85%	\$10.20	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	75	13	\$5,213	100%	N/A	\$9.84	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	98	13	\$7,969	100%	N/A	\$11.49	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	55	13	\$3,475	100%	N/A	\$8.96	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	38	13	\$2,233	100%	N/A	\$8.22	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	13	10	\$12,409	75%	95%	\$161.78	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$67	75%	35%	\$9.25	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	1	12	\$13	20%	95%	\$1.94	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.95	12	\$13	20%	95%	\$2.12	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	52	25	\$3,515	2.5%	95%	\$6.87	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	82	20	\$9,001	25%	95%	\$12.30	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	10	9	\$0.00	95%	75%	\$0.00	93
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	4	9	\$0.00	95%	50%	\$0.00	25
Gas	Large Retail	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	1	4	\$8	95%	95%	\$1.72	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	6	10	\$393	75%	85%	\$10.25	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Storage Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	75	13	\$5,213	100%	N/A	\$9.84	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	98	13	\$7,969	100%	N/A	\$11.49	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	55	13	\$3,475	100%	N/A	\$8.96	0.00
Gas	Large Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	38	13	\$2,233	100%	N/A	\$8.22	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	13	10	\$12,409	25%	95%	\$159.95	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$67	75%	35%	\$9.25	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	1	12	\$13	0.0%	95%	\$1.87	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.98	12	\$13	0.0%	95%	\$2.04	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	2	12	\$142	75%	75%	\$8.14	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	52	25	\$4,400	2.5%	95%	\$8.50	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	83	20	\$9,001	10%	95%	\$12.16	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	10	9	\$0.00	95%	75%	\$0.00	1,642
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	4	9	\$0.00	95%	50%	\$0.00	450
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	1	9	\$26	95%	25%	\$3.10	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	1	4	\$8	95%	95%	\$1.72	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Large Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	6	10	\$393	75%	85%	\$10.13	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	89	13	\$3,989	100%	N/A	\$6.36	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	29	13	\$544	100%	N/A	\$2.60	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	8	13	\$178	100%	N/A	\$2.83	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	11	13	\$178	100%	N/A	\$2.31	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	72	13	\$1,876	100%	N/A	\$3.69	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	13	10	\$12,409	25%	95%	\$160.40	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$67	75%	35%	\$9.25	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	1	12	\$13	0.0%	95%	\$1.94	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.95	12	\$13	0.0%	95%	\$2.12	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	52	25	\$3,515	2.5%	95%	\$6.81	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	82	20	\$9,001	25%	95%	\$12.20	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	10	9	\$0.00	95%	75%	\$0.00	158
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	4	9	\$0.00	95%	50%	\$0.00	43
Gas	Large Retail	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	1	4	\$8	95%	95%	\$1.72	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	6	10	\$393	75%	85%	\$10.16	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	89	13	\$3,989	100%	N/A	\$6.36	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	29	13	\$544	100%	N/A	\$2.60	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	8	13	\$178	100%	N/A	\$2.83	-0.0067578
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	11	13	\$178	100%	N/A	\$2.31	0.00
Gas	Large Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	72	13	\$1,876	100%	N/A	\$3.69	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	22	12	\$50	19%	90%	\$0.35	1,691
Gas	Lodging	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	13	12	\$15	19%	60%	\$0.17	1,173
Gas	Lodging	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	44	12	\$264	19%	85%	\$0.90	0.00
Gas	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	4	12	\$43	19%	70%	\$1.37	0.00
Gas	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	4	12	\$27	19%	55%	\$1.03	0.00
Gas	Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	10	12	\$109	11%	75%	\$1.50	0.00
Gas	Lodging	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	22	12	\$50	19%	90%	\$0.35	164
Gas	Lodging	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	13	12	\$15	19%	60%	\$0.17	113
Gas	Lodging	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	44	12	\$264	19%	85%	\$0.90	0.00
Gas	Lodging	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	4	12	\$43	19%	70%	\$1.37	0.00
Gas	Lodging	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	4	12	\$27	19%	55%	\$1.03	0.00
Gas	Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	10	12	\$109	11%	75%	\$1.50	0.00
Gas	Lodging	Pool Heat	Spa Covers	R-14	No Cover	Per Building	Existing	553	6	\$931	25%	35%	\$0.42	19,917
Gas	Lodging	Pool Heat	Swimming Pool Covers	Swimming Pool with Covers	No Cover	Per Building	Existing	3,135	5	\$1,074	50%	35%	\$0.10	243,867
Gas	Lodging	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	73	15	\$509	50%	95%	\$0.90	0.00
Gas	Lodging	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	135	20	\$1,779	75%	80%	\$1.48	0.00
Gas	Lodging	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	97	10	\$1,651	75%	20%	\$2.89	0.00
Gas	Lodging	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	35	10	\$483	75%	65%	\$2.32	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	370	20	\$11,412	100%	N/A	\$3.46	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	225	20	\$6,520	100%	N/A	\$3.24	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	324	20	\$9,780	100%	N/A	\$3.39	0.00
Gas	Lodging	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	245	10	\$4,117	75%	85%	\$2.85	0.00
Gas	Lodging	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	737	15	\$77,371	5.0%	70%	\$13.73	0.00
Gas	Lodging	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	368	5	\$1,590	75%	75%	\$1.26	0.00
Gas	Lodging	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	368	14	\$33,429	5.0%	95%	\$12.36	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	110	12	\$5,449	10%	85%	\$7.40	0.00
Gas	Lodging	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	245	12	\$1,356	10%	60%	\$0.83	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	285	25	\$7,184	45%	65%	\$2.56	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	61	25	\$3,456	25%	85%	\$5.75	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	858	25	\$12,824	15%	85%	\$1.52	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	109	25	\$3,957	15%	95%	\$3.67	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	781	25	\$31,528	10%	45%	\$4.11	0.00
Gas	Lodging	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	221	20	\$5,128	10%	95%	\$2.60	0.00
Gas	Lodging	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	307	7	\$16,161	90%	95%	\$11.67	0.00
Gas	Lodging	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	122	3	\$514	95%	50%	\$1.91	0.00
Gas	Lodging	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	35	10	\$483	95%	65%	\$2.32	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	370	20	\$11,412	100%	N/A	\$3.46	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	225	20	\$6,520	100%	N/A	\$3.24	0.00
Gas	Lodging	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	324	20	\$9,780	100%	N/A	\$3.39	0.00
Gas	Lodging	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	240	10	\$4,117	95%	85%	\$2.91	0.00
Gas	Lodging	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	138	7	\$18,833	95%	95%	\$30.17	0.00
Gas	Lodging	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	360	5	\$1,590	25%	25%	\$1.29	0.00
Gas	Lodging	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	360	14	\$33,429	5.0%	95%	\$12.64	0.00
Gas	Lodging	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	108	12	\$5,449	10%	85%	\$7.57	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	59	25	\$3,456	75%	85%	\$5.88	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	107	25	\$3,957	15%	95%	\$3.75	0.00
Gas	Lodging	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	291	25	\$3,295	95%	85%	\$1.15	0.00
Gas	Lodging	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	216	20	\$5,128	25%	95%	\$2.66	0.00
Gas	Lodging	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	75	15	\$509	50%	95%	\$0.89	0.00
Gas	Lodging	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	751	15	\$77,371	5.0%	70%	\$13.46	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	375	5	\$1,590	75%	75%	\$1.23	0.00
Gas	Lodging	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	62	18	\$6,108	45%	85%	\$11.53	0.00
Gas	Lodging	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	375	14	\$33,429	5.0%	95%	\$12.12	0.00
Gas	Lodging	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	112	12	\$5,449	10%	85%	\$7.25	0.00
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	157	20	\$4,130	3.3%	N/A	\$2.94	0.00
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	54	20	\$1,275	3.3%	N/A	\$2.61	0.00
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	107	20	\$2,649	3.3%	N/A	\$2.77	0.00
Gas	Lodging	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	250	12	\$1,356	10%	60%	\$0.81	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	291	25	\$7,184	45%	65%	\$2.51	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	62	25	\$3,456	25%	85%	\$5.64	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	75	20	\$1,392	45%	60%	\$2.08	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	45	20	\$244	45%	85%	\$0.61	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	875	25	\$12,824	15%	85%	\$1.49	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	112	25	\$3,957	15%	95%	\$3.59	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	796	25	\$31,528	10%	45%	\$4.03	0.00
Gas	Lodging	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	313	7	\$16,161	90%	95%	\$11.44	0.00
Gas	Lodging	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	125	3	\$572	95%	50%	\$2.09	0.00
Gas	Lodging	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	141	7	\$18,833	95%	95%	\$29.44	0.00
Gas	Lodging	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	369	5	\$1,590	25%	25%	\$1.26	0.00
Gas	Lodging	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	369	14	\$33,429	5.0%	95%	\$12.33	0.00
Gas	Lodging	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	110	12	\$5,449	10%	85%	\$7.38	0.00
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	157	20	\$4,130	3.3%	N/A	\$2.94	0.00
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	54	20	\$1,275	3.3%	N/A	\$2.61	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Space Heat Furnace	Furnace < 250 kBtu/h - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	107	20	\$2,649	3.3%	N/A	\$2.77	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	61	25	\$3,456	75%	85%	\$5.74	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	44	20	\$244	45%	85%	\$0.62	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	110	25	\$3,957	15%	95%	\$3.66	0.00
Gas	Lodging	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	298	25	\$3,295	95%	85%	\$1.12	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	46	9	\$402	25%	95%	\$1.59	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	21	14	\$165	5.0%	95%	\$1.03	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	359	10	\$7,070	55%	80%	\$3.34	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$71	10%	35%	\$9.26	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	12	12	\$160	60%	95%	\$1.96	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	11	12	\$157	60%	95%	\$2.11	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	71	12	\$509	75%	75%	\$1.06	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,439	25	\$15,998	2.5%	95%	\$1.13	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	2,266	20	\$5,128	10%	95%	\$0.25	33,111
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	277	9	\$10	95%	75%	\$0.01	38,203
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	114	9	\$5	95%	50%	\$0.01	10,487
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	43	9	\$211	95%	25%	\$0.90	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	68	4	\$409	95%	95%	\$2.10	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	149	10	\$185	95%	85%	\$0.21	23,303
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	120	10	\$465	95%	25%	\$0.66	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	179	10	\$3,140	75%	85%	\$2.97	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	2,075	13	\$18,953	100%	N/A	\$1.30	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	2,717	13	\$28,968	100%	N/A	\$1.52	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	1,520	13	\$12,636	100%	N/A	\$1.19	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	1,064	13	\$8,121	100%	N/A	\$1.09	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	46	9	\$402	25%	95%	\$1.59	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	21	14	\$165	5.0%	95%	\$1.03	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	358	10	\$7,070	55%	80%	\$3.35	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$71	10%	35%	\$9.26	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	11	12	\$152	60%	95%	\$1.94	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	10	12	\$152	60%	95%	\$2.12	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,432	25	\$12,799	2.5%	95%	\$0.91	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	2,256	20	\$5,128	25%	95%	\$0.26	4,328
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	276	9	\$10	95%	75%	\$0.01	3,577
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	113	9	\$5	95%	50%	\$0.01	981
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	68	4	\$409	95%	95%	\$2.10	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	149	10	\$185	95%	85%	\$0.21	2,192
Gas	Lodging	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	179	10	\$3,140	75%	85%	\$2.98	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	2,075	13	\$18,953	100%	N/A	\$1.30	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	2,717	13	\$28,968	100%	N/A	\$1.52	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	1,520	13	\$12,636	100%	N/A	\$1.19	0.00
Gas	Lodging	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	1,064	13	\$8,121	100%	N/A	\$1.09	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	46	9	\$402	25%	95%	\$1.59	0.00
Gas	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	21	14	\$165	5.0%	95%	\$1.03	0.00
Gas	Lodging	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	362	10	\$7,070	25%	80%	\$3.32	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$71	75%	35%	\$9.26	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	12	12	\$160	50%	95%	\$1.96	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	11	12	\$157	50%	95%	\$2.11	0.00
Gas	Lodging	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	72	12	\$509	75%	75%	\$1.05	0.00
Gas	Lodging	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	1,448	25	\$15,998	2.5%	95%	\$1.12	0.00
Gas	Lodging	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	2,281	20	\$5,128	10%	95%	\$0.25	43,632
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	279	9	\$10	95%	75%	\$0.01	50,342
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	115	9	\$5	95%	50%	\$0.01	13,819
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	43	9	\$211	95%	25%	\$0.89	0.00
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	68	4	\$409	95%	95%	\$2.10	0.00
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	149	10	\$185	95%	85%	\$0.21	30,501
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	120	10	\$465	95%	25%	\$0.66	0.00
Gas	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	181	10	\$3,140	75%	85%	\$2.95	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	2,459	13	\$14,512	100%	N/A	\$0.84	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	820	13	\$1,985	100%	N/A	\$0.34	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	247	13	\$651	100%	N/A	\$0.38	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	303	13	\$651	100%	N/A	\$0.31	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	1,993	13	\$6,828	100%	N/A	\$0.49	293,175

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Lodging	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	46	9	\$402	25%	95%	\$1.59	0.00
Gas	Lodging	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	21	14	\$165	5.0%	95%	\$1.03	0.00
Gas	Lodging	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	361	10	\$7,070	25%	80%	\$3.33	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$71	75%	35%	\$9.26	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	11	12	\$152	50%	95%	\$1.94	0.00
Gas	Lodging	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	10	12	\$152	50%	95%	\$2.12	0.00
Gas	Lodging	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	1,444	25	\$12,799	2.5%	95%	\$0.90	0.00
Gas	Lodging	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	2,275	20	\$5,128	25%	95%	\$0.25	5,533
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	279	9	\$10	95%	75%	\$0.01	4,534
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	114	9	\$5	95%	50%	\$0.01	1,244
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	68	4	\$409	95%	95%	\$2.10	0.00
Gas	Lodging	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	149	10	\$185	95%	85%	\$0.21	2,754
Gas	Lodging	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	180	10	\$3,140	75%	85%	\$2.95	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	2,459	13	\$14,512	100%	N/A	\$0.84	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	820	13	\$1,985	100%	N/A	\$0.34	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	247	13	\$651	100%	N/A	\$0.38	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	303	13	\$651	100%	N/A	\$0.31	0.00
Gas	Lodging	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	1,993	13	\$6,828	100%	N/A	\$0.49	31,428
Gas	Miscellaneous	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	6	12	\$14	1.0%	90%	\$0.33	88
Gas	Miscellaneous	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	2	12	\$1	1.0%	90%	\$0.13	46
Gas	Miscellaneous	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	6	12	\$38	1.0%	85%	\$0.90	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	3	12	\$34	1.0%	70%	\$1.39	0.00
Gas	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	1	12	\$7	1.0%	55%	\$1.00	0.00
Gas	Miscellaneous	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	1	12	\$14	1.0%	75%	\$1.47	0.00
Gas	Miscellaneous	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	6	12	\$14	1.0%	90%	\$0.33	8
Gas	Miscellaneous	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	2	12	\$1	1.0%	90%	\$0.13	4
Gas	Miscellaneous	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	6	12	\$38	1.0%	85%	\$0.90	0.00
Gas	Miscellaneous	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	3	12	\$34	1.0%	70%	\$1.39	0.00
Gas	Miscellaneous	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	1	12	\$7	1.0%	55%	\$1.00	0.00
Gas	Miscellaneous	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	1	12	\$14	1.0%	75%	\$1.47	0.00
Gas	Miscellaneous	Pool Heat	Spa Covers	R-14	No Cover	Per Building	Existing	190	6	\$931	25%	35%	\$1.23	0.00
Gas	Miscellaneous	Pool Heat	Swimming Pool Covers	Swimming Pool with Cover	No Cover	Per Building	Existing	1,079	5	\$1,074	50%	35%	\$0.29	177,700
Gas	Miscellaneous	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	69	15	\$219	50%	95%	\$0.41	12,829
Gas	Miscellaneous	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	191	20	\$612	75%	80%	\$0.36	43,858
Gas	Miscellaneous	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	41	10	\$709	75%	20%	\$2.89	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	15	10	\$207	75%	65%	\$2.32	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	524	20	\$3,929	100%	N/A	\$0.84	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	319	20	\$2,245	100%	N/A	\$0.79	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	459	20	\$3,368	100%	N/A	\$0.82	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	348	10	\$2,058	75%	85%	\$1.00	0.00
Gas	Miscellaneous	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,044	15	\$26,640	15%	70%	\$3.33	0.00
Gas	Miscellaneous	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	522	5	\$547	75%	75%	\$0.31	141,090
Gas	Miscellaneous	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	522	14	\$11,510	5.0%	95%	\$3.00	0.00
Gas	Miscellaneous	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	156	12	\$5,450	1.0%	85%	\$5.22	0.00
Gas	Miscellaneous	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	348	12	\$116	10%	60%	\$0.05	8,612

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	405	25	\$4,615	45%	65%	\$1.16	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	86	25	\$2,219	25%	85%	\$2.61	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,216	25	\$8,238	15%	85%	\$0.69	53,894
Gas	Miscellaneous	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	155	25	\$2,541	15%	95%	\$1.66	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,107	25	\$20,251	10%	45%	\$1.86	0.00
Gas	Miscellaneous	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	313	20	\$1,766	10%	95%	\$0.63	12,484
Gas	Miscellaneous	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	435	7	\$5,565	90%	95%	\$2.84	0.00
Gas	Miscellaneous	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	174	3	\$177	95%	50%	\$0.46	29,936
Gas	Miscellaneous	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	15	10	\$207	95%	65%	\$2.32	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	524	20	\$3,929	100%	N/A	\$0.84	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	319	20	\$2,245	100%	N/A	\$0.79	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	459	20	\$3,368	100%	N/A	\$0.82	0.00
Gas	Miscellaneous	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	340	10	\$2,058	95%	85%	\$1.03	0.00
Gas	Miscellaneous	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	196	7	\$6,485	95%	95%	\$7.33	0.00
Gas	Miscellaneous	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	510	5	\$547	25%	25%	\$0.31	1,493
Gas	Miscellaneous	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	510	14	\$11,510	5.0%	95%	\$3.07	0.00
Gas	Miscellaneous	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	153	12	\$5,450	1.0%	85%	\$5.34	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	84	25	\$2,219	75%	85%	\$2.66	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	152	25	\$2,541	15%	95%	\$1.70	0.00
Gas	Miscellaneous	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	412	25	\$2,117	95%	85%	\$0.52	10,825
Gas	Miscellaneous	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	306	20	\$1,766	25%	95%	\$0.65	1,631
Gas	Miscellaneous	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	71	15	\$219	50%	95%	\$0.40	90,860
Gas	Miscellaneous	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,065	15	\$26,640	15%	70%	\$3.27	0.00
Gas	Miscellaneous	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	532	5	\$547	75%	75%	\$0.30	966,217
Gas	Miscellaneous	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	88	18	\$2,103	45%	85%	\$2.80	0.00
Gas	Miscellaneous	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	532	14	\$11,510	5.0%	95%	\$2.94	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	159	12	\$5,450	1.0%	85%	\$5.12	0.00
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	223	20	\$1,422	12%	N/A	\$0.71	770
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	77	20	\$439	12%	N/A	\$0.63	0.00
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	152	20	\$912	12%	N/A	\$0.67	418
Gas	Miscellaneous	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	355	12	\$116	10%	60%	\$0.05	59,390
Gas	Miscellaneous	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	413	25	\$4,615	45%	65%	\$1.14	0.00
Gas	Miscellaneous	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	88	25	\$2,219	25%	85%	\$2.55	0.00
Gas	Miscellaneous	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	106	20	\$469	45%	60%	\$0.49	71,783
Gas	Miscellaneous	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	63	20	\$82	45%	85%	\$0.14	67,742
Gas	Miscellaneous	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,240	25	\$8,238	15%	85%	\$0.68	391,635
Gas	Miscellaneous	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	158	25	\$2,541	15%	95%	\$1.63	0.00
Gas	Miscellaneous	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,129	25	\$20,251	10%	45%	\$1.83	0.00
Gas	Miscellaneous	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	443	7	\$5,565	90%	95%	\$2.78	0.00
Gas	Miscellaneous	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	177	3	\$197	95%	50%	\$0.51	202,910
Gas	Miscellaneous	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	201	7	\$6,485	95%	95%	\$7.15	0.00
Gas	Miscellaneous	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	523	5	\$547	25%	25%	\$0.31	10,213
Gas	Miscellaneous	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	523	14	\$11,510	5.0%	95%	\$3.00	0.00
Gas	Miscellaneous	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	157	12	\$5,450	1.0%	85%	\$5.21	0.00
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	223	20	\$1,422	12%	N/A	\$0.71	8
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	77	20	\$439	12%	N/A	\$0.63	0.00
Gas	Miscellaneous	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	152	20	\$912	12%	N/A	\$0.67	4
Gas	Miscellaneous	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	86	25	\$2,219	75%	85%	\$2.60	0.00
Gas	Miscellaneous	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	62	20	\$82	45%	85%	\$0.15	5,294

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	156	25	\$2,541	15%	95%	\$1.66	0.00
Gas	Miscellaneous	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	423	25	\$2,117	95%	85%	\$0.51	74,046
Gas	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1	9	\$14	1.0%	95%	\$1.65	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	0.77	14	\$6	0.5%	95%	\$1.07	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	6	10	\$2,434	55%	95%	\$61.48	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.13	12	\$8	75%	35%	\$9.56	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.20	12	\$2	1.0%	95%	\$1.88	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.19	12	\$2	1.0%	95%	\$2.05	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	1	12	\$50	75%	75%	\$5.67	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	26	25	\$1,600	2.5%	95%	\$6.06	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	42	20	\$1,766	10%	95%	\$4.68	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	75%	\$0.00	3,024
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	2	9	\$0.00	95%	50%	\$0.00	830
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.80	9	\$7	95%	25%	\$1.59	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	45	4	\$273	95%	95%	\$2.10	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	2	10	\$6	95%	85%	\$0.39	1,754
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2	10	\$15	95%	25%	\$1.25	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	3	10	\$106	75%	95%	\$5.36	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	15	10	\$89	2.5%	95%	\$0.99	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	38	13	\$1,894	100%	N/A	\$6.96	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	50	13	\$2,896	100%	N/A	\$8.13	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	28	13	\$1,263	100%	N/A	\$6.34	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	19	13	\$812	100%	N/A	\$5.82	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1	9	\$14	1.0%	95%	\$1.65	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	0.77	14	\$6	0.5%	95%	\$1.07	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	6	10	\$2,434	55%	95%	\$61.76	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.13	12	\$8	75%	35%	\$9.56	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.20	12	\$2	1.0%	95%	\$1.91	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.18	12	\$2	1.0%	95%	\$2.09	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	26	25	\$1,280	2.5%	95%	\$4.87	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	42	20	\$1,766	25%	95%	\$4.70	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	75%	\$0.00	283
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	2	9	\$0.00	95%	50%	\$0.00	77
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	45	4	\$273	95%	95%	\$2.10	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	2	10	\$6	95%	85%	\$0.39	165
Gas	Miscellaneous	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	3	10	\$106	75%	95%	\$5.38	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	15	10	\$89	2.5%	95%	\$0.99	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	38	13	\$1,894	100%	N/A	\$6.96	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	50	13	\$2,896	100%	N/A	\$8.13	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	28	13	\$1,263	100%	N/A	\$6.34	0.00
Gas	Miscellaneous	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	19	13	\$812	100%	N/A	\$5.82	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1	9	\$14	1.0%	95%	\$1.65	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	0.77	14	\$6	0.5%	95%	\$1.07	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	6	10	\$2,434	25%	95%	\$61.06	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.13	12	\$8	75%	35%	\$9.56	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.20	12	\$2	5.0%	95%	\$1.88	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	0.19	12	\$2	5.0%	95%	\$2.05	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	1	12	\$50	75%	75%	\$5.63	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	27	25	\$1,600	2.5%	95%	\$6.02	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	42	20	\$1,766	10%	95%	\$4.65	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	5	9	\$0.00	95%	75%	\$0.00	4,972
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	2	9	\$0.00	95%	50%	\$0.00	1,364
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.81	9	\$7	95%	25%	\$1.58	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	45	4	\$273	95%	95%	\$2.10	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	2	10	\$6	95%	85%	\$0.39	2,864
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	2	10	\$15	95%	25%	\$1.25	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	3	10	\$106	75%	95%	\$5.32	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	15	10	\$89	2.5%	95%	\$0.98	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	46	13	\$1,452	100%	N/A	\$4.50	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	15	13	\$198	100%	N/A	\$1.85	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	4	13	\$64	100%	N/A	\$2.00	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	5	13	\$64	100%	N/A	\$1.63	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	37	13	\$683	100%	N/A	\$2.61	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1	9	\$14	1.0%	95%	\$1.65	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	0.77	14	\$6	0.5%	95%	\$1.07	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	6	10	\$2,434	25%	95%	\$61.24	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.13	12	\$8	75%	35%	\$9.56	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.20	12	\$2	5.0%	95%	\$1.91	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	0.18	12	\$2	5.0%	95%	\$2.09	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	27	25	\$1,280	2.5%	95%	\$4.83	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	42	20	\$1,766	25%	95%	\$4.66	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	5	9	\$0.00	95%	75%	\$0.00	478
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	2	9	\$0.00	95%	50%	\$0.00	131
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	45	4	\$273	95%	95%	\$2.10	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	2	10	\$6	95%	85%	\$0.39	276
Gas	Miscellaneous	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	3	10	\$106	75%	95%	\$5.33	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	15	10	\$89	2.5%	95%	\$0.99	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	46	13	\$1,452	100%	N/A	\$4.50	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	15	13	\$198	100%	N/A	\$1.85	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	4	13	\$64	100%	N/A	\$2.00	-0.0201038
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	5	13	\$64	100%	N/A	\$1.63	0.00
Gas	Miscellaneous	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	37	13	\$683	100%	N/A	\$2.61	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	321	12	\$722	40%	90%	\$0.34	89,414
Gas	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	201	12	\$215	40%	60%	\$0.16	62,031
Gas	Restaurant	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	642	12	\$3,847	40%	85%	\$0.90	0.00
Gas	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	146	12	\$1,350	40%	70%	\$1.39	0.00
Gas	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	59	12	\$400	40%	45%	\$1.01	0.00
Gas	Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	159	12	\$1,571	39%	75%	\$1.48	0.00
Gas	Restaurant	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	321	12	\$722	40%	90%	\$0.34	8,675
Gas	Restaurant	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	201	12	\$215	40%	60%	\$0.16	6,018
Gas	Restaurant	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	642	12	\$3,847	40%	85%	\$0.90	0.00
Gas	Restaurant	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	146	12	\$1,350	40%	70%	\$1.39	0.00
Gas	Restaurant	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	59	12	\$400	40%	45%	\$1.01	0.00
Gas	Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	159	12	\$1,571	39%	75%	\$1.48	0.00
Gas	Restaurant	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	48	20	\$290	75%	80%	\$0.67	1,721
Gas	Restaurant	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	28	10	\$488	75%	20%	\$2.88	0.00
Gas	Restaurant	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	10	10	\$143	75%	65%	\$2.33	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	132	20	\$1,865	100%	N/A	\$1.58	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	80	20	\$1,065	100%	N/A	\$1.48	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	116	20	\$1,598	100%	N/A	\$1.55	0.00
Gas	Restaurant	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	87	10	\$2,058	75%	85%	\$3.98	0.00
Gas	Restaurant	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	131	14	\$5,463	5.0%	95%	\$5.64	0.00
Gas	Restaurant	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	39	12	\$5,449	65%	85%	\$20.67	0.00
Gas	Restaurant	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	87	12	\$169	10%	60%	\$0.29	309
Gas	Restaurant	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	102	25	\$2,190	45%	65%	\$2.18	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	21	25	\$1,053	25%	85%	\$4.89	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	211	25	\$3,909	15%	85%	\$1.88	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	39	25	\$1,206	15%	95%	\$3.12	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	279	25	\$9,611	10%	45%	\$3.50	0.00
Gas	Restaurant	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	79	20	\$838	10%	95%	\$1.19	0.00
Gas	Restaurant	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	109	7	\$2,640	90%	95%	\$5.33	0.00
Gas	Restaurant	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	43	3	\$84	95%	50%	\$0.88	0.00
Gas	Restaurant	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	10	10	\$143	95%	65%	\$2.33	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	132	20	\$1,865	100%	N/A	\$1.58	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	80	20	\$1,065	100%	N/A	\$1.48	0.00
Gas	Restaurant	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	116	20	\$1,598	100%	N/A	\$1.55	0.00
Gas	Restaurant	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	86	10	\$2,058	95%	85%	\$4.07	0.00
Gas	Restaurant	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	49	7	\$3,077	95%	95%	\$13.77	0.00
Gas	Restaurant	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	129	14	\$5,463	5.0%	95%	\$5.77	0.00
Gas	Restaurant	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	38	12	\$5,449	65%	85%	\$21.13	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	21	25	\$1,053	75%	85%	\$5.00	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	38	25	\$1,206	15%	95%	\$3.19	0.00
Gas	Restaurant	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	104	25	\$1,004	95%	85%	\$0.98	0.00
Gas	Restaurant	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	77	20	\$838	25%	95%	\$1.22	0.00
Gas	Restaurant	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	22	18	\$998	45%	85%	\$5.26	0.00
Gas	Restaurant	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	134	14	\$5,463	5.0%	95%	\$5.53	0.00
Gas	Restaurant	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	40	12	\$5,449	65%	85%	\$20.26	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	56	20	\$675	12%	N/A	\$1.34	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	19	20	\$208	12%	N/A	\$1.19	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	38	20	\$432	12%	N/A	\$1.26	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	89	12	\$169	10%	60%	\$0.28	3,245
Gas	Restaurant	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	104	25	\$2,190	45%	65%	\$2.14	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	22	25	\$1,053	25%	85%	\$4.80	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	26	20	\$437	45%	60%	\$1.83	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	16	20	\$76	45%	85%	\$0.53	3,702
Gas	Restaurant	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	215	25	\$3,909	15%	85%	\$1.85	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	40	25	\$1,206	15%	95%	\$3.06	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	285	25	\$9,611	10%	45%	\$3.43	0.00
Gas	Restaurant	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	112	7	\$2,640	90%	95%	\$5.22	0.00
Gas	Restaurant	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	44	3	\$93	95%	50%	\$0.95	0.00
Gas	Restaurant	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	50	7	\$3,077	95%	95%	\$13.44	0.00
Gas	Restaurant	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	132	14	\$5,463	5.0%	95%	\$5.63	0.00
Gas	Restaurant	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	39	12	\$5,449	65%	85%	\$20.62	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	56	20	\$675	12%	N/A	\$1.34	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	19	20	\$208	12%	N/A	\$1.19	0.00
Gas	Restaurant	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	38	20	\$432	12%	N/A	\$1.26	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	21	25	\$1,053	75%	85%	\$4.88	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	15	20	\$76	45%	85%	\$0.54	292
Gas	Restaurant	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	39	25	\$1,206	15%	95%	\$3.11	0.00
Gas	Restaurant	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	106	25	\$1,004	95%	85%	\$0.96	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	87	10	\$1,155	75%	95%	\$2.24	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$73	20%	35%	\$9.45	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	128	12	\$1,654	75%	95%	\$1.94	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	117	12	\$1,654	75%	95%	\$2.12	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	17	12	\$70	75%	75%	\$0.60	2,481
Gas	Restaurant	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	351	25	\$2,200	2.5%	95%	\$0.64	1,678
Gas	Restaurant	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	553	20	\$838	10%	95%	\$0.17	11,326
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	Per Building	Existing	67	9	\$0.41	95%	75%	\$0.00	13,068
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	Per Building	Existing	27	9	\$0.00	95%	50%	\$0.00	3,587
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	Per Building	Existing	10	9	\$16	95%	25%	\$0.29	676
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.6 GPM (Federal Standard)	Per Building	Existing	43	4	\$259	95%	75%	\$2.10	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	No Faucet Control	Per Building	Existing	43	10	\$247	75%	75%	\$0.96	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	No Heat Recovery	Per Building	Existing	200	10	\$922	45%	95%	\$0.78	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	506	13	\$2,606	100%	N/A	\$0.73	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	663	13	\$3,983	100%	N/A	\$0.86	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	371	13	\$1,737	100%	N/A	\$0.67	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	259	13	\$1,117	100%	N/A	\$0.61	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Constant Circulation	Per Building	New	87	10	\$1,155	75%	95%	\$2.25	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Dishwasher Residential	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$73	20%	35%	\$9.45	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	Standard High Temp Commercial Dishwasher	Per Building	New	123	12	\$1,593	75%	95%	\$1.94	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Standard High Temp Commercial Dishwasher	Per Building	New	113	12	\$1,593	75%	95%	\$2.12	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	349	25	\$1,760	2.5%	95%	\$0.51	84
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Separate Boiler And Hot Water Heater	Per Building	New	550	20	\$838	25%	95%	\$0.17	1,493
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	Per Building	New	67	9	\$0.41	95%	75%	\$0.00	1,223

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	27	9	\$0.00	95%	50%	\$0.00	335
Gas	Restaurant	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	43	4	\$259	95%	75%	\$2.10	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	43	10	\$247	75%	75%	\$0.96	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	199	10	\$922	45%	95%	\$0.79	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	506	13	\$2,606	100%	N/A	\$0.73	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	663	13	\$3,983	100%	N/A	\$0.86	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	371	13	\$1,737	100%	N/A	\$0.67	0.00
Gas	Restaurant	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	259	13	\$1,117	100%	N/A	\$0.61	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	88	10	\$1,155	75%	95%	\$2.22	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$73	75%	35%	\$9.45	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	128	12	\$1,654	85%	95%	\$1.94	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	117	12	\$1,654	85%	95%	\$2.12	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	17	12	\$70	75%	75%	\$0.60	3,062
Gas	Restaurant	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	353	25	\$2,200	2.5%	95%	\$0.63	2,071
Gas	Restaurant	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	557	20	\$838	10%	95%	\$0.17	13,981
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	68	9	\$0.41	95%	75%	\$0.00	16,132
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	28	9	\$0.00	95%	50%	\$0.00	4,428
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	10	9	\$16	95%	25%	\$0.29	835
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	43	4	\$259	95%	75%	\$2.10	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	44	10	\$247	75%	75%	\$0.95	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	201	10	\$922	25%	95%	\$0.78	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	600	13	\$1,995	100%	N/A	\$0.47	128,287
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	200	13	\$272	100%	N/A	\$0.19	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	60	13	\$89	100%	N/A	\$0.21	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	74	13	\$89	100%	N/A	\$0.17	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	486	13	\$939	100%	N/A	\$0.28	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	88	10	\$1,155	75%	95%	\$2.23	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$73	75%	35%	\$9.45	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	123	12	\$1,593	85%	95%	\$1.94	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	113	12	\$1,593	85%	95%	\$2.12	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	352	25	\$1,760	2.5%	95%	\$0.51	97
Gas	Restaurant	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	555	20	\$838	25%	95%	\$0.17	1,729
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	68	9	\$0.41	95%	75%	\$0.00	1,417
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	28	9	\$0.00	95%	50%	\$0.00	389
Gas	Restaurant	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	43	4	\$259	95%	75%	\$2.10	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	44	10	\$247	75%	75%	\$0.95	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	201	10	\$922	25%	95%	\$0.78	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	600	13	\$1,995	100%	N/A	\$0.47	13,857
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	200	13	\$272	100%	N/A	\$0.19	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	60	13	\$89	100%	N/A	\$0.21	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	74	13	\$89	100%	N/A	\$0.17	0.00
Gas	Restaurant	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	486	13	\$939	100%	N/A	\$0.28	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	Existing	11	12	\$25	26%	90%	\$0.35	2,019
Gas	School	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	Existing	6	12	\$7	26%	60%	\$0.17	1,400
Gas	School	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	Existing	22	12	\$131	26%	85%	\$0.89	0.00
Gas	School	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	Existing	3	12	\$31	26%	70%	\$1.43	0.00
Gas	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	Existing	2	12	\$12	26%	40%	\$0.95	0.00
Gas	School	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	Existing	5	12	\$54	14%	75%	\$1.48	0.00
Gas	School	Cooking	Broiler	Infrared Cooking Broiler (37% Cooking Efficiency)	Standard Broiler	Per Building	New	11	12	\$25	26%	90%	\$0.35	195
Gas	School	Cooking	Convection Oven	High Efficiency Convection Oven	Standard Oven	Per Building	New	6	12	\$7	26%	60%	\$0.17	135
Gas	School	Cooking	Conveyor Oven	High Efficiency Model (42% Cooking Efficiency)	Standard Conveyor Oven	Per Building	New	22	12	\$131	26%	85%	\$0.89	0.00
Gas	School	Cooking	Fryers	CEE Efficient Deep Fat Fryers - 15 inch width Deep Fryer	15 Inch Width Standard Deep Fat Fryers	Per Building	New	3	12	\$31	26%	70%	\$1.43	0.00
Gas	School	Cooking	Griddle	ENERGY STAR Griddle	Non ENERGY STAR Griddle	Per Building	New	2	12	\$12	26%	40%	\$0.95	0.00
Gas	School	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Non ENERGY STAR Steam Cooker	Per Building	New	5	12	\$54	14%	75%	\$1.48	0.00
Gas	School	Pool Heat	Spa Covers	R-14	No Cover	Per Building	Existing	562	6	\$930	25%	35%	\$0.42	2,108
Gas	School	Pool Heat	Swimming Pool Covers	Swimming Pool with Covers	No Cover	Per Building	Existing	3,185	5	\$1,073	50%	35%	\$0.10	25,813
Gas	School	Space Heat Boiler	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	192	15	\$1,292	25%	95%	\$0.88	11,286
Gas	School	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	264	20	\$1,807	75%	80%	\$0.77	0.00
Gas	School	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	82	10	\$1,398	75%	20%	\$2.89	0.00
Gas	School	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	29	10	\$408	75%	65%	\$2.32	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	725	20	\$11,593	100%	N/A	\$1.79	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	442	20	\$6,624	100%	N/A	\$1.68	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	634	20	\$9,936	100%	N/A	\$1.76	0.00
Gas	School	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	481	10	\$4,118	75%	85%	\$1.45	0.00
Gas	School	Space Heat Boiler	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,443	15	\$78,602	15%	70%	\$7.12	0.00
Gas	School	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	721	5	\$1,616	75%	75%	\$0.65	120,023
Gas	School	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	721	14	\$33,961	5.0%	95%	\$6.41	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	216	12	\$5,450	25%	85%	\$3.78	0.00
Gas	School	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	481	12	\$682	10%	60%	\$0.21	7,326
Gas	School	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	946	25	\$10,350	45%	65%	\$1.11	0.00
Gas	School	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	119	25	\$4,982	25%	85%	\$4.23	0.00
Gas	School	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,157	25	\$18,476	15%	85%	\$1.63	0.00
Gas	School	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	215	25	\$5,701	15%	95%	\$2.70	0.00
Gas	School	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,530	25	\$45,423	10%	45%	\$3.02	0.00
Gas	School	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	433	20	\$5,212	10%	95%	\$1.35	0.00
Gas	School	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	601	7	\$16,418	90%	95%	\$6.05	0.00
Gas	School	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	240	3	\$522	95%	50%	\$0.99	0.00
Gas	School	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	29	10	\$408	95%	65%	\$2.32	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	725	20	\$11,593	100%	N/A	\$1.79	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	442	20	\$6,624	100%	N/A	\$1.68	0.00
Gas	School	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	634	20	\$9,936	100%	N/A	\$1.76	0.00
Gas	School	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	470	10	\$4,118	95%	85%	\$1.49	0.00
Gas	School	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	271	7	\$19,133	95%	95%	\$15.65	0.00
Gas	School	Space Heat Boiler	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	706	5	\$1,616	25%	25%	\$0.67	1,270
Gas	School	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	706	14	\$33,961	5.0%	95%	\$6.55	0.00
Gas	School	Space Heat Boiler	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	211	12	\$5,450	25%	85%	\$3.86	0.00
Gas	School	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	117	25	\$4,982	75%	85%	\$4.33	0.00
Gas	School	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	210	25	\$5,701	15%	95%	\$2.76	0.00
Gas	School	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	570	25	\$4,749	95%	85%	\$0.85	0.00
Gas	School	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	423	20	\$5,212	25%	95%	\$1.38	0.00
Gas	School	Space Heat Furnace	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Demand Controlled Ventilation (CO2 sensors)	Constant Ventilation	Per Building	Existing	196	15	\$1,292	25%	95%	\$0.86	23,050
Gas	School	Space Heat Furnace	Convert Constant Volume Air System to VAV	Variable Volume Air System	Constant Volume Air System	Per Building	Existing	1,472	15	\$78,602	15%	70%	\$6.98	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	Existing	736	5	\$1,616	75%	75%	\$0.64	246,817
Gas	School	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	122	18	\$6,205	45%	85%	\$5.98	0.00
Gas	School	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	736	14	\$33,961	5.0%	95%	\$6.28	0.00
Gas	School	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	220	12	\$5,450	25%	85%	\$3.70	0.00
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	308	20	\$4,196	1.7%	N/A	\$1.53	0.00
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	107	20	\$1,295	1.7%	N/A	\$1.35	0.00
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	210	20	\$2,691	1.7%	N/A	\$1.44	0.00
Gas	School	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	490	12	\$682	10%	60%	\$0.21	15,066
Gas	School	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	965	25	\$10,350	45%	65%	\$1.09	0.00
Gas	School	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	122	25	\$4,982	25%	85%	\$4.15	0.00
Gas	School	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	147	20	\$3,392	45%	60%	\$2.59	0.00
Gas	School	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	88	20	\$592	45%	85%	\$0.75	15,735
Gas	School	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	1,180	25	\$18,476	15%	85%	\$1.59	0.00
Gas	School	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	219	25	\$5,701	15%	95%	\$2.64	0.00
Gas	School	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	1,560	25	\$45,423	10%	45%	\$2.96	0.00
Gas	School	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	613	7	\$16,418	90%	95%	\$5.93	0.00
Gas	School	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	245	3	\$581	95%	50%	\$1.08	0.00
Gas	School	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	277	7	\$19,133	95%	95%	\$15.27	0.00
Gas	School	Space Heat Furnace	Direct Digital Control System-Installation	Installation of EMS System	Pneumatic Controls	Per Building	New	723	5	\$1,616	25%	25%	\$0.65	2,640
Gas	School	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	723	14	\$33,961	5.0%	95%	\$6.39	0.00
Gas	School	Space Heat Furnace	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	217	12	\$5,450	25%	85%	\$3.77	0.00
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	308	20	\$4,196	1.7%	N/A	\$1.53	0.00
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	107	20	\$1,295	1.7%	N/A	\$1.35	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	210	20	\$2,691	1.7%	N/A	\$1.44	0.00
Gas	School	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	120	25	\$4,982	75%	85%	\$4.22	0.00
Gas	School	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	86	20	\$592	45%	85%	\$0.77	1,346
Gas	School	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	215	25	\$5,701	15%	95%	\$2.69	0.00
Gas	School	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	584	25	\$4,749	95%	85%	\$0.83	0.00
Gas	School	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	11	9	\$100	25%	95%	\$1.60	0.00
Gas	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	5	14	\$41	5.0%	95%	\$1.03	0.00
Gas	School	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	59	10	\$7,182	55%	95%	\$20.36	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$74	20%	35%	\$9.57	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	19	12	\$258	70%	95%	\$1.95	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	18	12	\$258	70%	95%	\$2.13	0.00
Gas	School	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	11	12	\$113	75%	75%	\$1.42	0.00
Gas	School	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	239	25	\$3,599	2.5%	95%	\$1.53	0.00
Gas	School	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	377	20	\$5,212	10%	95%	\$1.55	0.00
Gas	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	46	9	\$2	95%	75%	\$0.01	6,631
Gas	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	19	9	\$0.00	95%	50%	\$0.00	1,820
Gas	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$25	95%	25%	\$0.66	0.00
Gas	School	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	82	4	\$491	95%	75%	\$2.10	0.00
Gas	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	9	10	\$23	95%	85%	\$0.40	1,599
Gas	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	7	10	\$56	95%	25%	\$1.22	0.00
Gas	School	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	29	10	\$393	75%	75%	\$2.23	0.00
Gas	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	136	10	\$328	25%	95%	\$0.41	7,010

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	345	13	\$4,266	100%	N/A	\$1.76	0.00
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	452	13	\$6,518	100%	N/A	\$2.05	0.00
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	253	13	\$2,844	100%	N/A	\$1.60	0.00
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	177	13	\$1,828	100%	N/A	\$1.47	0.00
Gas	School	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	11	9	\$100	25%	95%	\$1.60	0.00
Gas	School	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	5	14	\$41	5.0%	95%	\$1.03	0.00
Gas	School	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	59	10	\$7,182	55%	95%	\$20.45	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$74	20%	35%	\$9.57	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	19	12	\$258	70%	95%	\$1.95	0.00
Gas	School	Water Heat Gt 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	18	12	\$258	70%	95%	\$2.13	0.00
Gas	School	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	238	25	\$2,880	2.5%	95%	\$1.23	0.00
Gas	School	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	375	20	\$5,212	25%	95%	\$1.56	0.00
Gas	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	46	9	\$2	95%	75%	\$0.01	620
Gas	School	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	18	9	\$0.00	95%	50%	\$0.00	170
Gas	School	Water Heat Gt 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	82	4	\$491	95%	75%	\$2.10	0.00
Gas	School	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	9	10	\$23	95%	85%	\$0.40	150
Gas	School	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	29	10	\$393	75%	75%	\$2.24	0.00
Gas	School	Water Heat Gt 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	136	10	\$328	25%	95%	\$0.41	656
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	345	13	\$4,266	100%	N/A	\$1.76	0.00
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	452	13	\$6,518	100%	N/A	\$2.05	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	253	13	\$2,844	100%	N/A	\$1.60	0.00
Gas	School	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	177	13	\$1,828	100%	N/A	\$1.47	0.00
Gas	School	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	11	9	\$100	25%	95%	\$1.60	0.00
Gas	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	5	14	\$41	5.0%	95%	\$1.03	0.00
Gas	School	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	60	10	\$7,182	25%	95%	\$20.22	0.00
Gas	School	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	1	12	\$74	75%	35%	\$9.57	0.00
Gas	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	19	12	\$258	75%	95%	\$1.95	0.00
Gas	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	Existing	18	12	\$258	75%	95%	\$2.13	0.00
Gas	School	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	12	12	\$113	75%	75%	\$1.42	0.00
Gas	School	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	241	25	\$3,599	2.5%	95%	\$1.52	0.00
Gas	School	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	380	20	\$5,212	10%	95%	\$1.54	0.00
Gas	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	46	9	\$2	95%	75%	\$0.01	10,188
Gas	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	19	9	\$0.00	95%	50%	\$0.00	2,796
Gas	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	7	9	\$25	95%	25%	\$0.65	0.00
Gas	School	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	Existing	82	4	\$491	95%	75%	\$2.10	0.00
Gas	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	9	10	\$23	95%	85%	\$0.40	2,440
Gas	School	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	7	10	\$56	95%	25%	\$1.22	0.00
Gas	School	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	30	10	\$393	75%	75%	\$2.21	0.00
Gas	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	Existing	137	10	\$328	25%	95%	\$0.41	10,771
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	409	13	\$3,265	100%	N/A	\$1.14	0.00
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	136	13	\$447	100%	N/A	\$0.47	16,857

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	41	13	\$147	100%	N/A	\$0.51	0.00
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	50	13	\$147	100%	N/A	\$0.42	0.00
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	332	13	\$1,538	100%	N/A	\$0.66	0.00
Gas	School	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	11	9	\$100	25%	95%	\$1.60	0.00
Gas	School	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	5	14	\$41	5.0%	95%	\$1.03	0.00
Gas	School	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	60	10	\$7,182	25%	95%	\$20.28	0.00
Gas	School	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	1	12	\$74	75%	35%	\$9.57	0.00
Gas	School	Water Heat Le 55 Gal	Dishwashing - Commercial - High Temp	High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	19	12	\$258	75%	95%	\$1.95	0.00
Gas	School	Water Heat Le 55 Gal	Dishwashing - Commercial - Low Temp	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Building	New	18	12	\$258	75%	95%	\$2.13	0.00
Gas	School	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	240	25	\$2,880	2.5%	95%	\$1.22	0.00
Gas	School	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	379	20	\$5,212	25%	95%	\$1.54	0.00
Gas	School	Water Heat Le 55 Gal	Water Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	46	9	\$2	95%	75%	\$0.01	963
Gas	School	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	19	9	\$0.00	95%	50%	\$0.00	264
Gas	School	Water Heat Le 55 Gal	Low-Flow Pre-Rinse Spray Valves	1.0 GPM	1.6 GPM (Federal Standard)	Per Building	New	82	4	\$491	95%	75%	\$2.10	0.00
Gas	School	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	9	10	\$23	95%	85%	\$0.40	231
Gas	School	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	30	10	\$393	75%	75%	\$2.22	0.00
Gas	School	Water Heat Le 55 Gal	Water Cooled Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End use	No Heat Recovery	Per Building	New	137	10	\$328	25%	95%	\$0.41	1,018
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	409	13	\$3,265	100%	N/A	\$1.14	0.00
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	136	13	\$447	100%	N/A	\$0.47	1,914
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	41	13	\$147	100%	N/A	\$0.51	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	50	13	\$147	100%	N/A	\$0.42	0.00
Gas	School	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	332	13	\$1,538	100%	N/A	\$0.66	0.00
Gas	Small Office	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	102	20	\$539	75%	80%	\$0.59	8,040
Gas	Small Office	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	45	10	\$778	75%	20%	\$2.88	0.00
Gas	Small Office	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	16	10	\$228	75%	65%	\$2.32	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	280	20	\$3,461	100%	N/A	\$1.39	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	170	20	\$1,977	100%	N/A	\$1.30	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	245	20	\$2,967	100%	N/A	\$1.36	0.00
Gas	Small Office	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	186	10	\$2,059	75%	85%	\$1.88	0.00
Gas	Small Office	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	279	14	\$10,138	5.0%	95%	\$4.95	0.00
Gas	Small Office	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	186	12	\$250	10%	60%	\$0.20	1,445
Gas	Small Office	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	216	25	\$2,969	45%	65%	\$1.40	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	46	25	\$1,429	25%	85%	\$3.14	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	447	25	\$5,300	15%	85%	\$1.21	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	83	25	\$1,634	15%	95%	\$2.00	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	591	25	\$13,031	10%	45%	\$2.24	0.00
Gas	Small Office	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	167	20	\$1,555	10%	95%	\$1.04	0.00
Gas	Small Office	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	232	7	\$4,901	90%	95%	\$4.67	0.00
Gas	Small Office	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	93	3	\$155	95%	50%	\$0.76	0.00
Gas	Small Office	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	16	10	\$228	95%	65%	\$2.32	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	280	20	\$3,461	100%	N/A	\$1.39	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	170	20	\$1,977	100%	N/A	\$1.30	0.00
Gas	Small Office	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	245	20	\$2,967	100%	N/A	\$1.36	0.00
Gas	Small Office	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	181	10	\$2,059	95%	85%	\$1.92	0.00
Gas	Small Office	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	104	7	\$5,712	95%	95%	\$12.08	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Office	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	272	14	\$10,138	5.0%	95%	\$5.06	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	45	25	\$1,429	75%	85%	\$3.21	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	81	25	\$1,634	15%	95%	\$2.04	0.00
Gas	Small Office	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	220	25	\$1,362	95%	85%	\$0.63	1,834
Gas	Small Office	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	163	20	\$1,555	25%	95%	\$1.07	0.00
Gas	Small Office	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	47	18	\$1,852	45%	85%	\$4.62	0.00
Gas	Small Office	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	284	14	\$10,138	5.0%	95%	\$4.85	0.00
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	119	20	\$1,252	12%	N/A	\$1.18	0.00
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	41	20	\$386	12%	N/A	\$1.05	0.00
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	81	20	\$803	12%	N/A	\$1.11	0.00
Gas	Small Office	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	189	12	\$250	10%	60%	\$0.20	25,468
Gas	Small Office	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	220	25	\$2,969	45%	65%	\$1.37	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	47	25	\$1,429	25%	85%	\$3.08	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	56	20	\$260	45%	60%	\$0.51	34,175
Gas	Small Office	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	34	20	\$46	45%	85%	\$0.15	29,427
Gas	Small Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	456	25	\$5,300	15%	85%	\$1.18	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	84	25	\$1,634	15%	95%	\$1.96	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	603	25	\$13,031	10%	45%	\$2.20	0.00
Gas	Small Office	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	237	7	\$4,901	90%	95%	\$4.58	0.00
Gas	Small Office	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	94	3	\$173	95%	50%	\$0.84	0.00
Gas	Small Office	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	107	7	\$5,712	95%	95%	\$11.79	0.00
Gas	Small Office	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	279	14	\$10,138	5.0%	95%	\$4.94	0.00
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	119	20	\$1,252	12%	N/A	\$1.18	0.00
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	41	20	\$386	12%	N/A	\$1.05	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Office	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	81	20	\$803	12%	N/A	\$1.11	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	46	25	\$1,429	75%	85%	\$3.13	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	33	20	\$46	45%	85%	\$0.15	2,313
Gas	Small Office	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	83	25	\$1,634	15%	95%	\$2.00	0.00
Gas	Small Office	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	226	25	\$1,362	95%	85%	\$0.61	32,664
Gas	Small Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	3	10	\$2,144	55%	80%	\$98.62	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.28	12	\$17	90%	35%	\$9.44	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.73	12	\$31	75%	75%	\$6.43	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	14	25	\$1,000	2.5%	95%	\$6.90	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	23	20	\$1,555	10%	95%	\$7.50	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	2	9	\$0.00	95%	75%	\$0.00	1,330
Gas	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	50%	\$0.00	365
Gas	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.44	9	\$4	95%	25%	\$1.91	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	1	10	\$59	75%	85%	\$5.47	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	21	13	\$1,184	100%	N/A	\$7.92	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	27	13	\$1,810	100%	N/A	\$9.25	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	15	13	\$789	100%	N/A	\$7.21	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	10	13	\$507	100%	N/A	\$6.62	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	3	10	\$2,144	55%	80%	\$99.08	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.28	12	\$17	90%	35%	\$9.44	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	14	25	\$800	2.5%	95%	\$5.54	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	23	20	\$1,555	25%	95%	\$7.53	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	2	9	\$0.00	95%	75%	\$0.00	124

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Office	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	50%	\$0.00	34
Gas	Small Office	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	1	10	\$59	75%	85%	\$5.49	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	21	13	\$1,184	100%	N/A	\$7.92	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	27	13	\$1,810	100%	N/A	\$9.25	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	15	13	\$789	100%	N/A	\$7.21	0.00
Gas	Small Office	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	10	13	\$507	100%	N/A	\$6.62	0.00
Gas	Small Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	3	10	\$2,144	25%	80%	\$97.96	0.00
Gas	Small Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.28	12	\$17	75%	35%	\$9.44	0.00
Gas	Small Office	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.74	12	\$31	75%	75%	\$6.39	0.00
Gas	Small Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	14	25	\$1,000	2.5%	95%	\$6.85	0.00
Gas	Small Office	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	23	20	\$1,555	10%	95%	\$7.45	0.00
Gas	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	2	9	\$0.00	95%	75%	\$0.00	2,187
Gas	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	50%	\$0.00	600
Gas	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.44	9	\$4	95%	25%	\$1.90	0.00
Gas	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	1	10	\$59	75%	85%	\$5.43	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	25	13	\$906	100%	N/A	\$5.12	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	8	13	\$123	100%	N/A	\$2.09	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	2	13	\$40	100%	N/A	\$2.26	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	3	13	\$40	100%	N/A	\$1.84	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	20	13	\$426	100%	N/A	\$2.97	0.00
Gas	Small Office	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	3	10	\$2,144	25%	80%	\$98.23	0.00
Gas	Small Office	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.28	12	\$17	75%	35%	\$9.44	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Office	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	14	25	\$800	2.5%	95%	\$5.50	0.00
Gas	Small Office	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	23	20	\$1,555	25%	95%	\$7.47	0.00
Gas	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	2	9	\$0.00	95%	75%	\$0.00	210
Gas	Small Office	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	50%	\$0.00	57
Gas	Small Office	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	1	10	\$59	75%	85%	\$5.45	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	25	13	\$906	100%	N/A	\$5.12	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	8	13	\$123	100%	N/A	\$2.09	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	2	13	\$40	100%	N/A	\$2.26	-0.0089994
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	3	13	\$40	100%	N/A	\$1.84	0.00
Gas	Small Office	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	20	13	\$426	100%	N/A	\$2.97	0.00
Gas	Small Retail	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	86	20	\$365	75%	80%	\$0.47	3,534
Gas	Small Retail	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	32	10	\$548	75%	20%	\$2.89	0.00
Gas	Small Retail	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	11	10	\$160	75%	65%	\$2.32	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	237	20	\$2,347	100%	N/A	\$1.11	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	144	20	\$1,341	100%	N/A	\$1.04	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	207	20	\$2,012	100%	N/A	\$1.09	0.00
Gas	Small Retail	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	157	10	\$2,058	75%	85%	\$2.22	0.00
Gas	Small Retail	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	236	14	\$6,877	5.0%	95%	\$3.97	0.00
Gas	Small Retail	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	157	12	\$146	10%	60%	\$0.14	635
Gas	Small Retail	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	309	25	\$2,757	45%	65%	\$0.91	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	39	25	\$1,326	25%	85%	\$3.44	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	378	25	\$4,921	15%	85%	\$1.32	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	70	25	\$1,518	15%	95%	\$2.19	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	500	25	\$12,099	10%	45%	\$2.46	0.00
Gas	Small Retail	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	141	20	\$1,055	10%	95%	\$0.84	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Retail	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	196	7	\$3,324	90%	95%	\$3.75	0.00
Gas	Small Retail	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	78	3	\$105	95%	50%	\$0.61	0.00
Gas	Small Retail	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	11	10	\$160	95%	65%	\$2.32	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	237	20	\$2,347	100%	N/A	\$1.11	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	144	20	\$1,341	100%	N/A	\$1.04	0.00
Gas	Small Retail	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	207	20	\$2,012	100%	N/A	\$1.09	0.00
Gas	Small Retail	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	154	10	\$2,058	95%	85%	\$2.27	0.00
Gas	Small Retail	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	88	7	\$3,874	95%	95%	\$9.68	0.00
Gas	Small Retail	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	231	14	\$6,877	5.0%	95%	\$4.06	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	38	25	\$1,326	75%	85%	\$3.52	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	68	25	\$1,518	15%	95%	\$2.24	0.00
Gas	Small Retail	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	186	25	\$1,265	95%	85%	\$0.69	806
Gas	Small Retail	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	138	20	\$1,055	25%	95%	\$0.85	0.00
Gas	Small Retail	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	40	18	\$1,256	45%	85%	\$3.70	0.00
Gas	Small Retail	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	240	14	\$6,877	5.0%	95%	\$3.89	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	100	20	\$849	12%	N/A	\$0.94	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	35	20	\$262	12%	N/A	\$0.84	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	68	20	\$545	12%	N/A	\$0.89	0.00
Gas	Small Retail	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	160	12	\$146	10%	60%	\$0.14	5,946
Gas	Small Retail	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	316	25	\$2,757	45%	65%	\$0.89	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	40	25	\$1,326	25%	85%	\$3.37	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	48	20	\$522	45%	60%	\$1.22	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	28	20	\$91	45%	85%	\$0.35	6,782
Gas	Small Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	386	25	\$4,921	15%	85%	\$1.30	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	71	25	\$1,518	15%	95%	\$2.15	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Retail	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	510	25	\$12,099	10%	45%	\$2.41	0.00
Gas	Small Retail	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	200	7	\$3,324	90%	95%	\$3.67	0.00
Gas	Small Retail	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	80	3	\$117	95%	50%	\$0.67	0.00
Gas	Small Retail	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	90	7	\$3,874	95%	95%	\$9.45	0.00
Gas	Small Retail	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	236	14	\$6,877	5.0%	95%	\$3.96	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	100	20	\$849	12%	N/A	\$0.94	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	35	20	\$262	12%	N/A	\$0.84	0.00
Gas	Small Retail	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	68	20	\$545	12%	N/A	\$0.89	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	39	25	\$1,326	75%	85%	\$3.43	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	28	20	\$91	45%	85%	\$0.36	536
Gas	Small Retail	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	70	25	\$1,518	15%	95%	\$2.19	0.00
Gas	Small Retail	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	191	25	\$1,265	95%	85%	\$0.67	7,573
Gas	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1	9	\$14	25%	95%	\$1.63	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	0.77	14	\$5	5.0%	95%	\$1.01	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	2	10	\$1,454	75%	95%	\$115.58	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$39	10%	35%	\$9.52	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.42	12	\$25	75%	75%	\$9.01	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	8	25	\$800	2.5%	95%	\$9.53	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	13	20	\$1,055	10%	95%	\$8.79	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	75%	\$0.00	143
Gas	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	0.68	9	\$0.00	95%	50%	\$0.00	39
Gas	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.25	9	\$7	95%	25%	\$5.61	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	1	10	\$117	75%	85%	\$18.72	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	12	13	\$711	100%	N/A	\$8.22	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	16	13	\$1,086	100%	N/A	\$9.59	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	9	13	\$473	100%	N/A	\$7.48	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	6	13	\$304	100%	N/A	\$6.87	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1	9	\$14	25%	95%	\$1.63	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	0.77	14	\$5	5.0%	95%	\$1.01	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	2	10	\$1,454	75%	95%	\$116.12	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$39	10%	35%	\$9.52	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	8	25	\$639	2.5%	95%	\$7.66	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	13	20	\$1,055	25%	95%	\$8.83	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	75%	\$0.00	13
Gas	Small Retail	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	0.67	9	\$0.00	95%	50%	\$0.00	3
Gas	Small Retail	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	1	10	\$117	75%	85%	\$18.81	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	12	13	\$711	100%	N/A	\$8.22	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	16	13	\$1,086	100%	N/A	\$9.59	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	9	13	\$473	100%	N/A	\$7.48	0.00
Gas	Small Retail	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	6	13	\$304	100%	N/A	\$6.87	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	Existing	1	9	\$14	25%	95%	\$1.63	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	Existing	0.77	14	\$5	5.0%	95%	\$1.01	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	2	10	\$1,454	25%	95%	\$114.81	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.61	12	\$39	75%	35%	\$9.52	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.43	12	\$25	75%	75%	\$8.95	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	8	25	\$800	2.5%	95%	\$9.46	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	13	20	\$1,055	10%	95%	\$8.73	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	75%	\$0.00	236
Gas	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	0.68	9	\$0.00	95%	50%	\$0.00	64
Gas	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.25	9	\$7	95%	25%	\$5.57	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	1	10	\$117	75%	85%	\$18.60	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	14	13	\$544	100%	N/A	\$5.31	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	4	13	\$74	100%	N/A	\$2.17	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	1	13	\$24	100%	N/A	\$2.34	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	1	13	\$24	100%	N/A	\$1.91	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	11	13	\$255	100%	N/A	\$3.08	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Clothes Washer Commercial	ENERGY STAR Commercial Clothes Washer - MEF = 2.43, WF = 4.0	Commercial 2013 Federal Standard Clothes Washer - MEF = 1.6, WF = 8.5	Per Building	New	1	9	\$14	25%	95%	\$1.63	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Clothes Washer Residential	ENERGY STAR - CEE Tier 1 Residential Clothes Washer - MEF = 2.0, WF = 6.0	Residential 2011 Federal Standard Clothes Washer - MEF = 1.26, WF = 9.0	Per Building	New	0.77	14	\$5	5.0%	95%	\$1.01	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	2	10	\$1,454	25%	95%	\$115.13	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.61	12	\$39	75%	35%	\$9.52	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	8	25	\$639	2.5%	95%	\$7.59	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	13	20	\$1,055	25%	95%	\$8.76	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	75%	\$0.00	22

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Small Retail	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	0.68	9	\$0.00	95%	50%	\$0.00	6
Gas	Small Retail	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	1	10	\$117	75%	85%	\$18.65	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	14	13	\$544	100%	N/A	\$5.31	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	4	13	\$74	100%	N/A	\$2.17	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	1	13	\$24	100%	N/A	\$2.34	-0.0009709
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	1	13	\$24	100%	N/A	\$1.91	0.00
Gas	Small Retail	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	11	13	\$255	100%	N/A	\$3.08	0.00
Gas	Warehouse	Space Heat Boiler	Boiler - Economizer	Economizer	No Economizer	Per Building	Existing	16	20	\$467	75%	80%	\$3.18	0.00
Gas	Warehouse	Space Heat Boiler	Boiler - Pipe Insulation	2.0" of Insulation, assuming R-7.5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	36	10	\$619	75%	20%	\$2.88	0.00
Gas	Warehouse	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	Existing	13	10	\$182	75%	65%	\$2.33	0.00
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	Existing	45	20	\$2,999	100%	N/A	\$7.45	0.00
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	Existing	27	20	\$1,713	100%	N/A	\$6.99	0.00
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	Existing	39	20	\$2,570	100%	N/A	\$7.30	0.00
Gas	Warehouse	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	Existing	29	10	\$2,058	75%	85%	\$11.67	0.00
Gas	Warehouse	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	44	14	\$8,787	5.0%	95%	\$26.63	0.00
Gas	Warehouse	Space Heat Boiler	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	29	12	\$47	10%	60%	\$0.24	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	56	25	\$3,523	45%	65%	\$6.31	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	Existing	7	25	\$1,694	25%	85%	\$23.10	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	104	25	\$6,288	15%	85%	\$6.12	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	13	25	\$1,940	15%	95%	\$14.73	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	95	25	\$15,459	10%	45%	\$16.52	0.00
Gas	Warehouse	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	26	20	\$1,348	10%	95%	\$5.61	0.00
Gas	Warehouse	Space Heat Boiler	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	37	7	\$4,248	90%	95%	\$25.14	0.00
Gas	Warehouse	Space Heat Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Building	Existing	14	3	\$135	95%	50%	\$4.11	0.00
Gas	Warehouse	Space Heat Boiler	Boiler - Pipe Insulation	3.0" of Insulation, assuming R-11	2.0" of Insulation, assuming R-7.5 (KY State Code)	Per Building	New	13	10	\$182	95%	65%	\$2.33	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - Advanced Efficiency	Advanced Efficiency - AFUE 96%	Standard Efficiency - AFUE 82%	Per Building	New	45	20	\$2,999	100%	N/A	\$7.45	0.00
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - High Efficiency	High Efficiency - AFUE 90%	Standard Efficiency - AFUE 82%	Per Building	New	27	20	\$1,713	100%	N/A	\$6.99	0.00
Gas	Warehouse	Space Heat Boiler	Boiler < 300 kBtuh - Premium Efficiency	Premium Efficiency - AFUE 94%	Standard Efficiency - AFUE 82%	Per Building	New	39	20	\$2,570	100%	N/A	\$7.30	0.00
Gas	Warehouse	Space Heat Boiler	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Building	New	29	10	\$2,058	95%	85%	\$11.93	0.00
Gas	Warehouse	Space Heat Boiler	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	16	7	\$4,950	95%	95%	\$65.02	0.00
Gas	Warehouse	Space Heat Boiler	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	43	14	\$8,787	5.0%	95%	\$27.23	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Ceiling	R-30	R-20ci (KY State Code)	Per Building	New	7	25	\$1,694	75%	85%	\$23.62	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	13	25	\$1,940	15%	95%	\$15.06	0.00
Gas	Warehouse	Space Heat Boiler	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	35	25	\$1,616	95%	85%	\$4.63	0.00
Gas	Warehouse	Space Heat Boiler	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	26	20	\$1,348	25%	95%	\$5.74	0.00
Gas	Warehouse	Space Heat Furnace	Duct Repair and Sealing	Reduction In Duct Losses to 5 %	No Repair or Sealing 15% duct losses	Per Building	Existing	7	18	\$1,605	45%	85%	\$24.85	0.00
Gas	Warehouse	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	Existing	45	14	\$8,787	5.0%	95%	\$26.11	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	19	20	\$1,085	3.3%	N/A	\$6.34	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	6	20	\$335	3.3%	N/A	\$5.63	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	Existing	13	20	\$696	3.3%	N/A	\$5.97	0.00
Gas	Warehouse	Space Heat Furnace	Infiltration Reduction	Install Caulking And Weatherstripping (ACH 0.65)	Infiltration Conditions (ACH 1.0)	Per Building	Existing	30	12	\$47	10%	60%	\$0.23	5,124
Gas	Warehouse	Space Heat Furnace	Insulation - Ceiling	R-20ci (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	58	25	\$3,523	45%	65%	\$6.18	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Duct	R-5 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	9	20	\$1,739	45%	60%	\$21.28	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	Existing	5	20	\$305	45%	85%	\$6.22	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Floor (non-slab)	R-30 (KY State Code)	Average R-Value Existing Conditions	Per Building	Existing	106	25	\$6,288	15%	85%	\$6.00	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	Existing	13	25	\$1,940	15%	95%	\$14.44	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Wall	R-13 + 7.5 (KY State Code)	Average Existing Conditions	Per Building	Existing	97	25	\$15,459	10%	45%	\$16.20	0.00
Gas	Warehouse	Space Heat Furnace	Re-Commissioning	Re-Commissioning	Average Existing Conditions	Per Building	Existing	38	7	\$4,248	90%	95%	\$24.65	0.00
Gas	Warehouse	Space Heat Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Building	Existing	15	3	\$150	95%	50%	\$4.49	0.00
Gas	Warehouse	Space Heat Furnace	Commissioning	Commissioning	Installed Conditions without Commissioning	Per Building	New	17	7	\$4,950	95%	95%	\$63.44	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Warehouse	Space Heat Furnace	Exhaust Air to Ventilation Air Heat Recovery	Exhaust Air to Ventilation Air Heat Recovery	No Heat Recovery	Per Building	New	45	14	\$8,787	5.0%	95%	\$26.56	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - Advanced Efficiency	Advanced Efficiency - 96% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	19	20	\$1,085	3.3%	N/A	\$6.34	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - High Efficiency	High Efficiency - 92% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	6	20	\$335	3.3%	N/A	\$5.63	0.00
Gas	Warehouse	Space Heat Furnace	Furnace < 250 kBtuh - Premium Efficiency	Premium Efficiency - 94% AFUE Gas Furnaces (Non-Weatherized)	Standard Efficiency - 90% AFUE Gas Furnaces (Non-Weatherized)	Per Building	New	13	20	\$696	3.3%	N/A	\$5.97	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Duct	R-8	R-5 (KY State Code)	Per Building	New	5	20	\$305	45%	85%	\$6.33	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Floor (non-slab)	R-38	R-30 (KY State Code)	Per Building	New	13	25	\$1,940	15%	95%	\$14.70	0.00
Gas	Warehouse	Space Heat Furnace	Insulation - Wall	R-13 + 10	R-13 + 7.5 (KY State Code)	Per Building	New	36	25	\$1,616	95%	85%	\$4.52	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1	10	\$1,858	55%	95%	\$222.22	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.06	12	\$4	75%	35%	\$10.22	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.28	12	\$25	75%	75%	\$13.43	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	5	25	\$799	2.5%	95%	\$14.33	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	8	20	\$1,348	10%	95%	\$16.91	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	75%	\$0.00	445
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	0.45	9	\$0.00	95%	50%	\$0.00	122
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.17	9	\$5	95%	25%	\$5.75	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	4	10	\$12	95%	85%	\$0.42	2,264
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	3	10	\$28	95%	25%	\$1.23	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	0.71	10	\$78	75%	95%	\$18.72	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	8	13	\$710	100%	N/A	\$12.36	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	10	13	\$1,085	100%	N/A	\$14.43	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	6	13	\$473	100%	N/A	\$11.25	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	Existing	4	13	\$304	100%	N/A	\$10.33	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1	10	\$1,858	55%	95%	\$223.24	0.00

Table F.2. Commercial Gas Measure Details

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Warehouse	Water Heat Gt 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.06	12	\$4	75%	35%	\$10.22	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	5	25	\$640	2.5%	95%	\$11.53	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	8	20	\$1,348	25%	95%	\$16.98	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	75%	\$0.00	41
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	0.45	9	\$0.00	95%	50%	\$0.00	11
Gas	Warehouse	Water Heat Gt 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	4	10	\$12	95%	85%	\$0.42	213
Gas	Warehouse	Water Heat Gt 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	0.70	10	\$78	75%	95%	\$18.80	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - Federal Standard 2015	Federal Standard 2015 Condensing Water Heater GT 55 Gal - EF 0.743	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	8	13	\$710	100%	N/A	\$12.36	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Condensing - High Efficiency	Condensing Water Heater GT 55 Gal - EF 0.85	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	10	13	\$1,085	100%	N/A	\$14.43	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater GT 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	6	13	\$473	100%	N/A	\$11.25	0.00
Gas	Warehouse	Water Heat Gt 55 Gal	Water Heater GT 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater GT 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater GT 55 Gal - EF 0.528	Per Building	New	4	13	\$304	100%	N/A	\$10.33	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	Existing	1	10	\$1,858	25%	95%	\$220.72	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	Existing	0.06	12	\$4	75%	35%	\$10.22	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Domestic Hot Water Pipe Insulation	1.0" of Insulation, assuming R-4 (KY State Code)	No Insulation	Per Building	Existing	0.28	12	\$25	75%	75%	\$13.34	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	Existing	5	25	\$799	2.5%	95%	\$14.23	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	Existing	9	20	\$1,348	10%	95%	\$16.79	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	1	9	\$0.00	95%	75%	\$0.00	732
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	Existing	0.45	9	\$0.00	95%	50%	\$0.00	200
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	2.2 GPM (Federal Code)	2.5 GPM	Per Building	Existing	0.17	9	\$5	95%	25%	\$5.71	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	Existing	4	10	\$12	95%	85%	\$0.42	3,698
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	2.5 GPM (Federal Code)	3.0 GPM	Per Building	Existing	3	10	\$28	95%	25%	\$1.23	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	Existing	0.71	10	\$78	75%	95%	\$18.59	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	9	13	\$544	100%	N/A	\$7.99	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	3	13	\$74	100%	N/A	\$3.27	0.00

Table F.2. Commercial Gas Measure Details

Exhibit MEH-3

Fuel Type	Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therms)	Measure Life	Incremental Cost per Unit	Percent of Installations Technically Feasible	Percent of Installations Incomplete	Levelized Cost (\$ per Therms)	2033 Cumulative Achievable Technical Potential (Therms)
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	0.97	13	\$24	100%	N/A	\$3.52	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	1	13	\$24	100%	N/A	\$2.87	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	Existing	7	13	\$256	100%	N/A	\$4.64	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Demand Controlled Circulating Systems	Demand Controlled Circulating Systems (VFD control by demand)	Constant Circulation	Per Building	New	1	10	\$1,858	25%	95%	\$221.34	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Dishwasher Residential	ENERGY STAR Dishwasher - 295 kWh/yr and 4.25 gal/cycle	Federal Standard 2010 Dishwasher - 355 kWh/yr and 6.5 gal/cycle	Per Building	New	0.06	12	\$4	75%	35%	\$10.22	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Drainwater Heat Recovery Water Heater	Install (Power-Pipe or GFX) - Heat Recovery Water Heater	No Heat Recovery System	Per Building	New	5	25	\$640	2.5%	95%	\$11.43	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Integrated Space Heating/Water Heating	Integrated System	Separate Boiler And Hot Water Heater	Per Building	New	8	20	\$1,348	25%	95%	\$16.84	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Building	New	1	9	\$0.00	95%	75%	\$0.00	70
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Building	New	0.45	9	\$0.00	95%	50%	\$0.00	19
Gas	Warehouse	Water Heat Le 55 Gal	Low-Flow Showerheads	1.5 GPM	2.5 GPM (Federal Code)	Per Building	New	4	10	\$12	95%	85%	\$0.42	357
Gas	Warehouse	Water Heat Le 55 Gal	Ultrasonic Faucet Control	Install Ultrasonic Motion Faucet Control	No Faucet Control	Per Building	New	0.71	10	\$78	75%	95%	\$18.64	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Condensing - High Efficiency	Condensing Water Heater LE 55 Gal - EF 0.90	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	9	13	\$544	100%	N/A	\$7.99	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - ENERGY STAR	ENERGY STAR Storage Water Heater LE 55 Gal - EF 0.67	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	3	13	\$74	100%	N/A	\$3.27	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - Federal Standard 2015	Federal Standard 2015 Storage Water Heater LE 55 Gal - EF 0.615	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	0.97	13	\$24	100%	N/A	\$3.52	-0.0025575
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Storage - High Efficiency	High Efficiency Storage Water Heater LE 55 Gal - EF 0.62	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	1	13	\$24	100%	N/A	\$2.87	0.00
Gas	Warehouse	Water Heat Le 55 Gal	Water Heater LE 55 Gal - Tankless - ENERGY STAR	ENERGY STAR Tankless Water Heater LE 55 Gal - EF 0.82	Federal Standard 2004 Storage Water Heater LE 55 Gal - EF 0.594	Per Building	New	7	13	\$256	100%	N/A	\$4.64	0.00

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

**JOINT APPLICATION OF LOUISVILLE GAS)
AND ELECTRIC COMPANY AND KENTUCKY)
UTILITIES COMPANY FOR REVIEW,)
MODIFICATION, AND CONTINUATION OF)
EXISTING, AND ADDITION OF NEW,)
DEMAND-SIDE MANAGEMENT AND ENERGY)
EFFICIENCY PROGRAMS)**

CASE NO. 2014-00003

**DIRECT TESTIMONY OF
DAVID E. HUFF
DIRECTOR OF CUSTOMER ENERGY EFFICIENCY AND
SMART GRID STRATEGY
LG&E AND KU SERVICES COMPANY**

Filed: January 17, 2014

1 **Q. Please state your name, position, and business address.**

2 A. My name is David E. Huff. I am the Director of Customer Energy Efficiency and
3 Smart Grid Strategy for LG&E and KU Services Company, which provides services
4 to Louisville Gas and Electric Company (“LG&E”) and Kentucky Utilities (“KU”)
5 (collectively, “Companies”). My business address is 220 West Main Street,
6 Louisville, Kentucky. A statement of my qualifications is attached as Appendix A.

7 **Q. Have you previously testified before the Commission?**

8 A. Yes. I testified most recently in Administrative Case No. 2012-00428, *In the Matter*
9 *of: Consideration of the Implementation of Smart Grid and Smart Meter*
10 *Technologies.*

11 **Q. Are you sponsoring any exhibits?**

12 A. Yes, I am sponsoring the following exhibits:

13 Exhibit DEH-1: *LG&E and KU Smart Meter Business Case Assessment* by
14 DNV KEMA Energy and Sustainability (“*Smart Meter*
15 *Study*”)

16 Exhibit DEH-2: *Responsive Pricing and Smart Metering Pilot Program*
17 *Final Report for Louisville Gas and Electric Company,*
18 *dated July 1, 2011*

19 Exhibit DEH-3: *Residential Smart Meters Study* by Bellomy Research, Inc.

20 Exhibit DEH-4: Illustrative screenshots of possible website interface for
21 Advanced Metering Systems participants

22 I am also co-sponsoring Exhibit MEH-1 to the testimony of Michael E. Hornung.

23 **Q. What is the purpose of your testimony?**

1 A. The purpose of my testimony is to describe the goals and objectives of the Advanced
2 Metering Systems proposal, which is one of the Companies' proposed demand-side
3 management/energy efficiency ("DSM-EE") efforts. The budgets and other metrics
4 concerning the Advanced Metering Systems are in Mr. Hornung's testimony and the
5 Louisville Gas and Electric Company and Kentucky Utilities Company 2015-2018
6 Demand-Side Management and Energy Efficiency Program Plan ("Proposed
7 DSM/EE Program Plan"). Robert M. Conroy's testimony addresses the capital-cost
8 recovery associated with the Advanced Metering Systems.

9 **Advanced Metering Systems**

10 **Q. What is the Companies' Advanced Metering Systems proposal?**

11 A. From a customer's perspective, the proposed Advanced Metering Systems will enable
12 up to 5,000 LG&E and 5,000 KU residential and small commercial customers (i.e.,
13 Rates RS and GS) to elect to have advanced meters installed on their service.
14 Customers with advanced meters will have enhanced energy usage information
15 available to them through a website.

16 On the utility side, the Advanced Metering Systems will involve adding
17 network infrastructure, computer systems to control the network and meters, a meter
18 data management system, and other hardware and software that can be used to serve
19 all of the Companies' advanced meters. The Advanced Metering Systems will also
20 require operating a network operation center and conducting field maintenance and
21 hardware and software maintenance.

22 **Q. Will receiving an advanced meter be purely voluntary?**

23 A. Yes. Only customers who request an advanced meter will receive one, and there will
24 be no minimum term for having an advanced meter; the Companies will remove them

1 upon request. Also, this customer service offering does not include customer
2 incentives to have an advanced meter (e.g., a bill credit for having an advanced meter
3 installed) beyond the benefit of more granular usage data provided through a website.
4 Exhibit DEH-4 contains illustrative screenshots of what the user interface of the
5 Advanced Metering Systems website might be like for a participant, including the
6 ability to access hourly usage data.

7 **Q. How did the Companies choose a 10,000 total advanced-meter cap for the**
8 **program?**

9 A. Two factors caused the Companies to choose a 10,000 advanced-meter cap for the
10 program. First, the *Smart Meter Study* indicates that opt-in rates for advanced meters
11 range from 5 percent to 28 percent nationwide, with an average acceptance for opt-in
12 programs of 11 percent.¹ A 1% participation rate is therefore a reasonable and
13 conservative expectation; 10,000 customers are roughly 1% of the Companies' over
14 900,000 electric customers. Second, a 10,000-customer sample is large enough to
15 provide the Companies a direct indication of customer desire for advanced meters
16 while reasonably limiting the Companies' and their customers' investment at this
17 time.

18 In addition to gaining information about the overall level of customer interest
19 in advanced metering, deploying up to 5,000 advanced meters in each of the
20 Companies' service territories will provide data on the geographic dispersion or
21 concentration of customer adoption of advanced meter capabilities. This information
22 will be valuable in estimating costs for a broader opt-in deployment of advanced
23 metering systems. For example, if adoption is generally dispersed, then cellular

¹ *Smart Meter Study* at 34.

1 communications may be the most economical option for a broader opt-in deployment,
2 but if adoption rates are higher in more urban concentrated areas as indicated by the
3 *Smart Meter Study*, then a company-owned radio-frequency system such as a mesh or
4 point to multi-point system may be more economical.

5 **Q. How will the Companies address demand for Advanced Metering Systems in**
6 **excess of the 5,000-meter cap for each utility?**

7 A. The Companies will keep a list of customers for each utility who desire but cannot
8 receive an advanced meter due to the 5,000-meter cap. The Companies will approach
9 the Commission about how to address the excess demand if it materializes, likely to
10 seek approval for expansion of Advanced Metering Systems to meet the excess
11 demand.

12 **Q. Why are the Companies proposing the Advanced Metering Systems?**

13 A. The Companies' primary purpose for proposing the Advanced Metering Systems is to
14 put in place the communications and control infrastructure necessary for possible
15 future advanced-meter deployments, as well as to provide participating customers
16 more detailed information about their consumption.

17 The Companies' purposes for the Advanced Metering Systems are consistent
18 with Kentucky law. KRS 278.285(1)(h) requires the Commission to consider when
19 reviewing a utility's proposed DSM-EE plan, "Next-generation residential utility
20 meters that can provide residents with amount of current utility usage, its cost, and
21 can be capable of being read by the utility either remotely or from the exterior of the
22 home." The advanced meters the Companies will deploy as part of the Advanced
23 Metering Systems are precisely such meters. As shown in the illustrative screenshots

1 included in Exhibit DEH-4, the Companies' Advanced Metering Systems will
 2 remotely read participating customers' meters and provide the customers with recent
 3 hourly energy usage data using a website portal. A customer's data should be
 4 available on the website within 48 hours of collection.

5 In addition to being consistent with KRS 278.285(1)(h), the Companies'
 6 purposes for the Advanced Metering Systems are consistent with the Commission's
 7 stated support for advanced meters. In its final order permitting LG&E to end its
 8 three-year responsive-pricing pilot for residential and general-service customers, the
 9 Commission directed LG&E to file quarterly reports until it filed an application for a
 10 dynamic-pricing or advanced-meter program.² The Companies are proposing the
 11 Advanced Metering Systems in accordance with the Commission's order.

12 **Q. What are the Advanced Metering Systems' estimated costs and benefits?**

13 A. The estimated annual costs are below:

Program Capital Costs

\$000s	2015	2016	2017	2018	Total
Capital, Equipment, Systems	\$383	\$1,149	\$1,149	\$1,149	\$3,830
Total Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830

Program O&M Costs

\$000s	2015	2016	2017	2018	Total
Equipment & Systems	\$50	\$150	\$150	\$150	\$500
Labor	\$162	\$169	\$176	\$183	\$690
Customer Education	\$230	\$230	\$230	\$0	\$689
Total O&M Expenses	\$442	\$549	\$556	\$333	\$1,879

Total Program Budget

\$000s	2015	2016	2017	2018	Total
Capital Expenses	\$383	\$1,149	\$1,149	\$1,149	\$3,830
O&M Expenses	\$442	\$549	\$556	\$333	\$1,879
Total	\$825	\$1,698	\$1,705	\$1,482	\$5,709

14

² In the Matter of: Request of Louisville Gas and Electric Company to Cancel and Withdraw the Tariffs for Its Responsive Pricing and Smart Metering Pilot Program, Case No. 2011-00440, Order at 9-10 (Mar. 22, 2012).

1 The Companies base the above capital- and operating-cost estimates primarily on the
2 results of the competitive bid process they recently performed for a 1,500-advanced-
3 meter installation in LG&E's Louisville downtown network. (The costs for the
4 downtown network project are not included in this DSM Advanced Metering Systems
5 request; rather, it is a separate project to gather enhanced engineering information for
6 network planning.) The capital-equipment estimates are higher than the range of
7 costs for similar equipment in the *Smart Meter Study's* Table 14 and Appendix D; the
8 large-scale deployments described in the Smart Meter Study likely benefitted from
9 volume discounts that will not be available for the proposed Advanced Metering
10 Systems, which will be smaller-scale. Nonetheless, the Companies will acquire
11 Advanced Metering Systems in a manner consistent with their standard procurement
12 practices, including using competitive-bid processes when appropriate, to ensure they
13 receive the best value for customers.

14 The Advanced Metering Systems' primary benefit is to provide customers
15 with disaggregated usage information, which customers could use to inform their
16 efficiency efforts. A significant secondary benefit will be the data the Companies
17 will acquire concerning the usage patterns and geographic concentration or dispersion
18 of participating customers, which will inform possible future advanced-metering
19 deployments.

20 **Q. Which costs of the Advanced Metering Systems do the Companies propose to**
21 **recover through their DSM-EE Cost-Recovery Mechanisms?**

22 A. The Companies propose to recover through their DSM-EE Cost Recovery
23 Mechanisms the costs of the advanced meters, network infrastructure, computer

1 systems to control the network and meters, meter data management system, operation
2 of the network, field maintenance, hardware and software maintenance, and other
3 hardware and software that would be used to serve all advanced meters. The
4 Companies propose to recover the capital costs of the Advanced Metering Systems
5 through the capital component of their DSM-EE Cost-Recovery Mechanisms (i.e., the
6 DCCR component). The Companies will recover the operating costs of the Advanced
7 Metering Systems through the mechanisms' DCR component.

8 **Q. Why are the Advanced Metering Systems a prudent use of DSM-EE resources at**
9 **this time?**

10 A. The Companies recently received the *Smart Meter Study* from a third-party vendor,
11 DNV KEMA. The Companies commissioned the study as part of their ongoing study
12 of advanced metering and consistently with the Commission's final order in the
13 responsive-pricing-pilot-termination case discussed above.³ In preparing the *Smart*
14 *Meter Study*, DNV KEMA reviewed the results of the LG&E 2009-2011 responsive
15 pricing pilot (the final report on the pilot is attached as Exhibit DEH-2) and a
16 customer survey the Companies commissioned the Bellomy Group to perform to
17 gauge customer receptivity to advanced meters (attached as Exhibit DEH-3).

18 The *Smart Meter Study* indicates that, although a full deployment of advanced
19 meters in the Companies' service territories would likely be uneconomical at this
20 time, a smaller targeted deployment could be economical.⁴ In particular, the *Smart*
21 *Meter Study* indicated that customers' willingness to engage with smart technology
22 and make use of the information it provides is crucial to making advanced meters

³ *Id.*

⁴ *Smart Meter Study* at 1.

1 economical in the Companies' service territories.⁵ Therefore, the Companies have
2 designed their proposed Advanced Metering Systems to have the best chance of
3 success by investing in Advanced Metering Systems only for those customers who
4 affirmatively choose to participate, making them most likely to engage with the
5 technology.

6 The other factor making it more economical to invest in Advanced Metering
7 Systems now is the decline in advanced-meter costs in recent years. The *Smart Meter*
8 *Study* suggests that these costs have now decreased sufficiently to make a targeted
9 advanced-meter deployment economical.⁶ Therefore, the time is right to explore
10 customers' interest in being equipped with the enhanced data advanced meters can
11 provide.

12 **Recommendation and Conclusion**

13 **Q. What is your recommendation concerning the Advanced Metering Systems?**

14 A. I recommend that the Commission approve the Advanced Metering Systems (as well
15 as the Companies' entire portfolio of proposed DSM-EE programs for 2015-18) as
16 proposed in the Companies' Application and Proposed DSM/EE Program Plan.

17 **Q. Does this conclude your testimony?**

18 A. Yes.

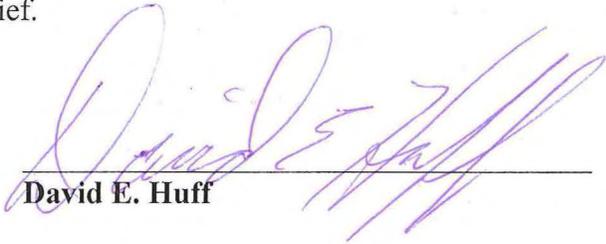
⁵ *Id.* at 50 ("A recent report by the Smart Meter Consumer Collaborative indicates that there are several factors that will heavily influence the potential for a successful business case for Smart Meter: 1. Customer participation levels in Time-Varying Rates, Prepayment and Customer Energy Management").

⁶ *Smart Meter Study* at 55.

VERIFICATION

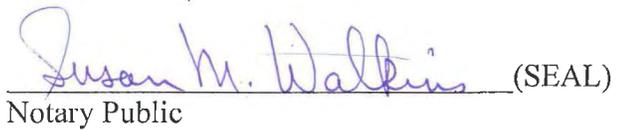
COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **David E. Huff**, being duly sworn, deposes and says that he is Director of Customer Energy Efficiency & Smart Grid Strategy for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.



David E. Huff

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 17th day of January 2014.



Notary Public (SEAL)

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State of Large, KY
~~My Commission Expires Mar. 19, 2017~~
Notary ID # 485723

APPENDIX A

David E. Huff

LG&E and KU Energy LLC
220 West Main Street
Louisville, Kentucky 40202

Education

MBA, Indiana University
BSME, Rose-Hulman Institute of Technology

Professional Experience

Louisville Gas and Electric and Kentucky Utilities

Director, Customer Energy Efficiency and Smart Grid Strategy	March 2010 - Present
Director, Distribution Operations	March 2003 – March 2010

LG&E Energy

Director, Revenue Collection Process	January 2000 – March 2003
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Louisville Gas and Electric

Director, Gas Operations Support & Interim Mktg Director	June 1997 – January 2000
Wholesale Excellence Team Leader	November 1995 – June 1997
Division Manager – Trimble County Station	July 1994 – November 1995
Operations Manager – Mill Creek Station	January 1992 – July 1994
Mechanical Engineer	1983 - 1992

Professional Memberships

Registered Professional Engineer – Kentucky
Kentucky Clean Fuels Coalition – Board Member
University of Louisville Conn Center for Renewable Energy Research -- Technical Advisory Board Member
University of Louisville Speed School of Engineering – Advisory Board Member of Electric & Computer Engineering Department
E-Source DSM Executive Council Member

Civic Activities

Boy Scouts of America Executive Committee Member and Volunteer – Lincoln Heritage Council
Past Project WARM Board Member
Committee Member of Boy Scout Troop 15
Eagle Scout

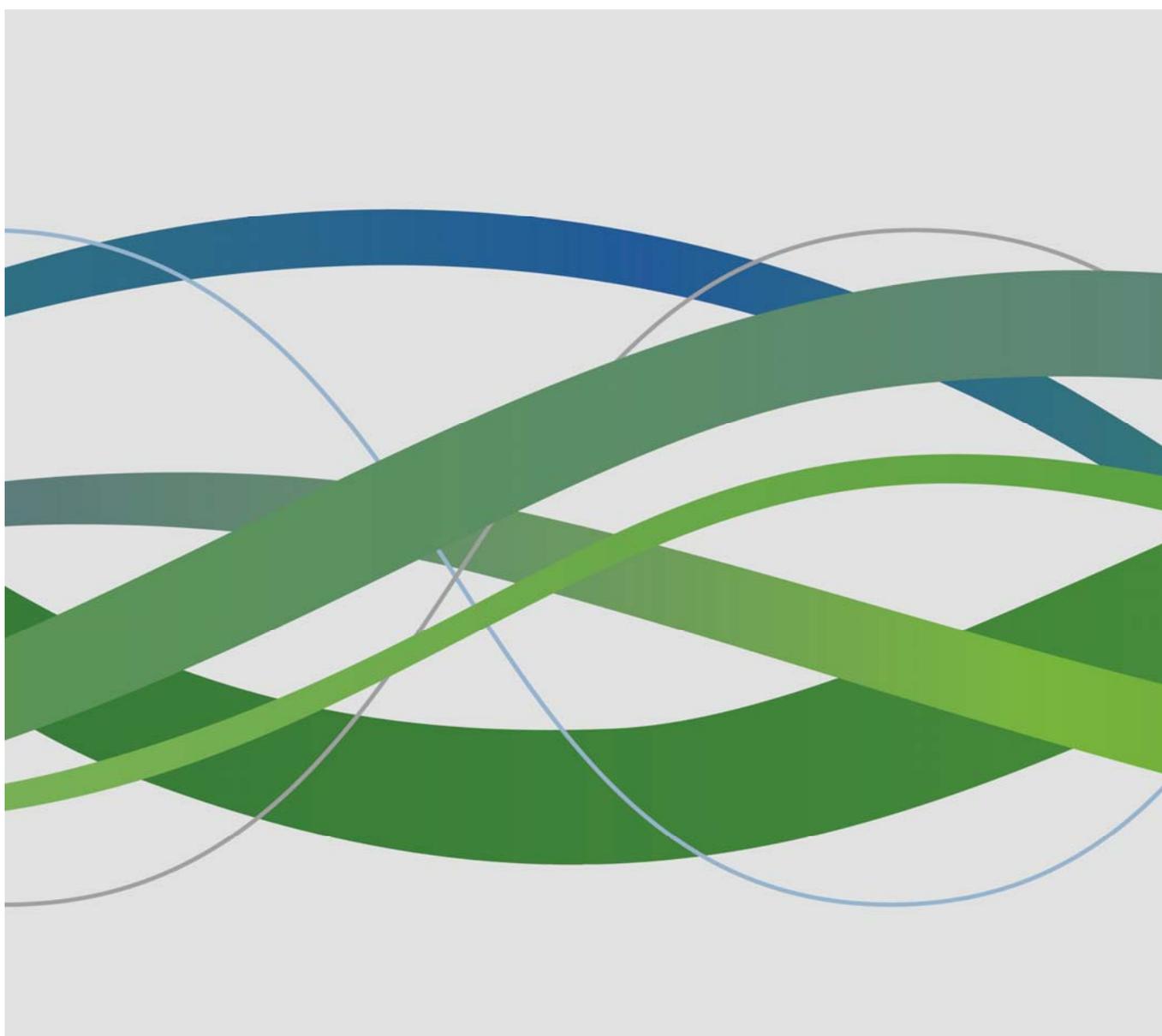


LG&E and KU

Smart Meter Business Case Assessment

Prepared by: DNV KEMA Energy and Sustainability (DNV KEMA)

Revised on December 13, 2013



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List of Acronyms

ACEEE	American Council for an Energy-Efficient Economy
ACS	American Community Survey (Census)
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
ARRA	American Recovery and Reinvestment Act (2009)
CAIDI	Customer average interruption duration index
CPP	Critical Peak Pricing
DA	Distribution Automation
DER	Distributed Energy Resources
DLC	Direct Load Control
DMS	Distribution Management System
DOE	Department of Energy
DSM	Demand-Side Management
EEI	Edison Electric Institute
EERS	Energy Efficiency Resource Standards
EIA	Energy Information Administration
EISA	Energy Independence and Security Act (2007)
EM&V	Evaluation, Measurement and Verification
EPACT	Energy Policy Act (2005)
EPRI	Electric Power Research Institute
FERC	Federal Energy Regulatory Commission
FCI	Fault Circuit Indicator
FLISR	Fault Location, Isolation and Service Restoration
IBB	Inclined Block Base
IHD	In-Home Display
IRP	Integrated Resource Plan (Filing)
LBNL	Lawrence Berkeley National Labs
LIHEAP	Low-Income Home Energy Assistance Program



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MAIFI	Momentary Average Interruption Frequency Index
MAS	Multiple Address System (Radio)
MED	Major Event Day
NARUC	National Association of Regulatory Utility Commissioners
NES	Nashville Electric Service (Utility Co.)
NPV	Net Present Value
NMS	Network Management System
OC-48	Optical Carrier (2.488 Gbps)
OMS	Outage Management System
PCT	Programmable Communicating Thermostat
PEV	Plug-in Electric Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
PLC	Power Line Carrier
PSC	Public Services Commission
PTR	Peak Time Rebate
PUC	Public Utilities Commission
RASS	Residential Appliance Saturation Survey
RECS	Residential Energy Consumption Survey
RPP	Responsive Pricing Pilot
RPS	Renewable Portfolio Standard
SaaS	Software as a Service (software distribution model)
SAIDI	System average interruption duration index
SAIFI	System average interruption frequency index
SCADA	Supervisory Control and Data Acquisition
SCF	Sectional Center Facility (Zip Code component)
SG	Smart Grid
SGCC	SG Consumer Collaborative
SGIG	SG Investment Grant
SONET	Synchronous Optical Network (Fiber Optic network technology)
TOU	Time of Use



1. Executive Summary

The report presents the results of an investigation into the prospects and potential features of a Smart Meter Strategy for LG&E and KU (“The Companies”). This study addresses the business case for Smart Meter deployment in the service territory, and includes a high level assessment of the costs and benefits of such a transformation to the utility and its customers. The work reflected in this document consists of an analysis of Companies, customer and industry data, and builds upon two important Smart Meter activities carried out by LG&E and KU: 1) the Responsive Pricing and Smart Meter Pilot Program conducted in 2009-2011, and 2) a customer survey conducted in 2012 to gauge consumer awareness and potential responsiveness to Smart Meters and related services.¹

The overall conclusion of this assessment is that LG&E and KU may have opportunities to benefit from a targeted AMI deployment, but that system-wide conversion is not justified at this time given the data analyzed. The most favorable strategy for AMI deployment would be one that is focused on urban/suburban areas where infrastructure needs coincide with geographic locations where high concentrations of customers reside. AMI technology is typically less costly to deploy in urban/suburban areas compared to rural areas. Here the economics of Smart Meters are most attractive from both an operational and a customer benefits standpoint, based on our analysis.

The relatively low costs of the existing meter reading and other services infrastructure in the LG&E and KU service territory does not justify full scale conversion based on our high level cost benefit analysis. Average customer electric bills are low as compared to the region and nationally, which makes customer reported expectations for engaging in time-varying rates unrealistic and unlikely to be realized.² In addition, customer response to existing DSM and demand response offerings, combined with the results of the pilot and an attitudinal survey indicate that large levels of customer engagement to Smart Meter related services are unlikely and thus would be inadequate to justify system-wide investment based on customer benefits.³ These outcomes are most likely a partial result of the low rates and low average electric bills paid by LG&E and KU customers.

Other key findings from this study are highlighted below.

¹Bellomy Research, Inc., Residential Smart Meter Study, January 17, 2012.

² Customers indicated an expectation of \$25 per month savings on their electric bills to engage in time-varying rate programs, which would represent fully 24 percent savings, whereas the pilot program results showed a realized average savings of only 1.4 percent.

³ Customer participation in energy efficiency programs was used as a proxy for voluntary or “opt-in” behavior, and is indicative of the level of interest that LG&E and KU customers have in saving energy and money on their bills.



- The cost of system-wide AMI deployment and operations over 20 years is estimated to be between \$204M - \$340M. The benefits from meter reading automation and automation of various field services over the same period are estimated up to \$141M.
- There are potentially other operational benefits that are not quantified in this report, including improvements in billing and collection, distribution system engineering and management, outage management, call center operations, customer management, and vehicle expenses.
- Were the Companies to offer time-differentiated rates as part of Smart Meter conversion, there is limited evidence that customers would respond in adequate number, or have the technological capability to take action.
- While customers responding to a Smart Meter survey indicated interest in time-varying rate options, their expectations for savings on the monthly bill are high - \$25 per month or 24 percent savings – when compared to actual pilot program savings of \$7.58 over the four month summer period, or \$1.89 per month (1.4 percent bill savings).

This investigation shows that the overall costs of a system-wide AMI deployment are somewhat higher compared to the quantified benefits of meter reading automation and automation of various field services. At the same time, taking into account the geographic character of the LG&E and KU service territory suggests that targeted deployments of AMI (i.e., in urban/suburban areas) might produce positive cost-benefit results.

The customer engagement results are less encouraging for the overall residential population, but are favorable within certain socio-demographic and geographic pockets of the service territory, as revealed in DNV KEMA's analysis of available data. These locations are likely to overlap with the urban/suburban locations that show the most promise for achieving operational benefits. Research indicates a high level of customer skepticism about the benefits of Smart Meters, with less than one quarter (22 percent overall) of interested households indicating a likelihood to engage with enhanced services such as time varying rates. The size of customer engagement is insufficient for a large scale deployment

These conclusions are based upon our findings from interviews with company staff across various departments that would be involved in Smart Meter deployment, extensive analysis of LG&E and KU customer data (primary and from secondary sources), comparative information from similar utilities, and a review of relevant industry literature on the experience of other pilot programs and early implementation programs.

Finally, the potential success of a Smart Meter program for LG&E and KU will depend on the following additional factors that are outside of the control of the Companies:

- **Macroeconomic factors** such as high unemployment rate and vacancy rates, and the general low cost-of-living profile in the service territory, are not generally conducive to high levels of



- participation in innovative rate or energy efficiency programs. While customer control is a culturally attractive concept for this population, survey results showed that those who indicated higher levels of awareness of Smart Meters were less likely to engage.
- **Customer attitudes** are considered an “external factor” in that they are ultimately outside of the Companies’ control. While they can be influenced through education and marketing, evidence shows that LG&E and KU’s customer base has limited receptivity to time varying rates that might be offered with Smart Meter conversion, or have unrealistic expectations for the monetary benefits that might result from their level of engagement.
 - **Technological development** is an issue of concern to both the Companies and consumers. AMI products have evolved and will continue to demonstrate new features, making it challenging to commit to a specific product line of Smart Meter equipment. Similarly, product developments for consumers have advanced significantly since the original design of the pilot, with many non-traditional new entrants in the home energy management and control space including ADT (security systems), Google, Verizon, etc. Consumers are therefore faced with technology obsolescence in making decisions about tools to adopt in their daily lives, further complicating the range of choices they have for controlling household costs.

Smart Meter Benefits

Smart Meter deployments have multiple costs, including converting customer meters to AMI to support Smart Metering with related infrastructure upgrades and installations, and organizational and programmatic changes necessary to make the system function. Understanding and quantifying the potential benefits of Smart Meter implementation is therefore critical to ensure that a deployment’s likely benefits exceed its likely costs. Figure 1 summarizes some key benefits identified in this investigation and compiled from industry sources and pilot programs launched elsewhere. Each of these is discussed in more detail in the full report.

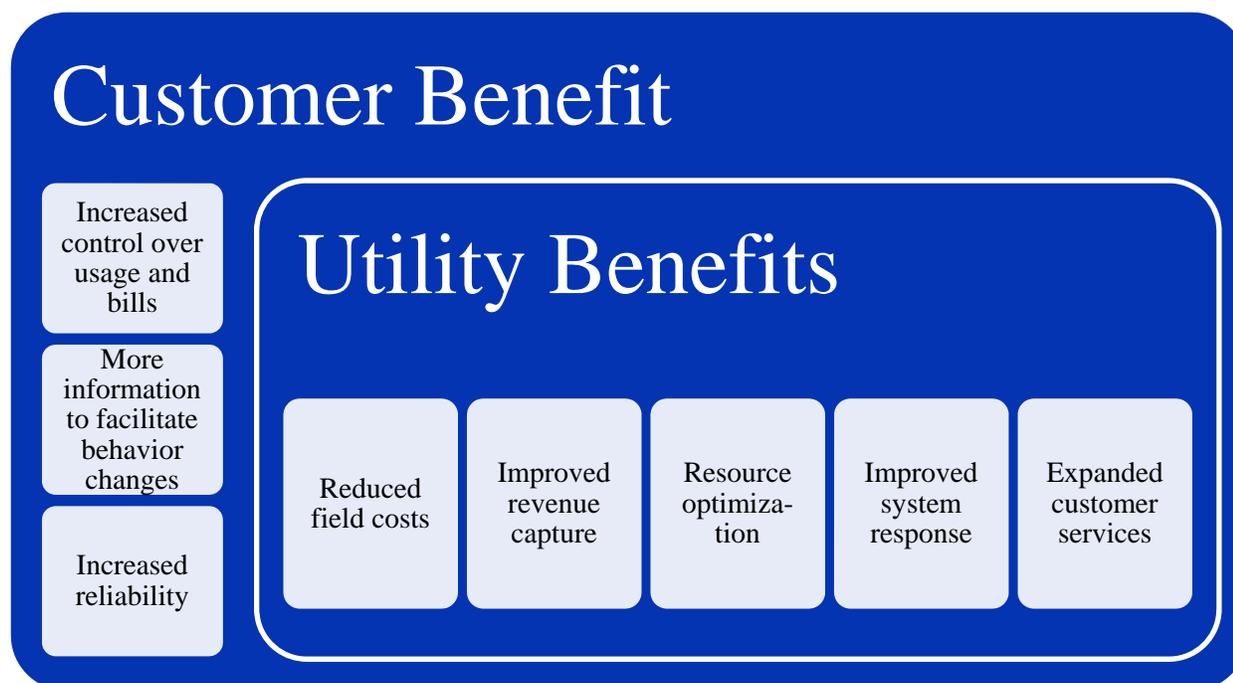


Figure 1: Smart Grid Benefit Categories

Customer Propensity to Participate

The Residential Smart Meter Study (2012) conducted by LG&E and KU provides insight into the likelihood of customer participation from the segment of the Companies' customers deemed most likely to participate in a Smart Meter program: customers who have email addresses on file with the Companies and who have access to the Internet. While this sample of just under 500 respondents skews to a younger population than the overall customer base, the responses are indicative of what one would consider to be representative of technology-engaged households. DNV KEMA conducted an analysis of the survey data and presents the results in a map of the service territory, below in Figure 2. Data at the zip-code level was aggregated into larger postal regions to account for the low number of respondents in some zip codes. "Time-Varying pricing plans" in the legend refers to the four time-varying options that were offered by the Companies during the pilot and tested in the survey.⁴

⁴ The time-varying rate options tested were Time of Use (TOU), Critical Peak Pricing (CPP), Peak Time Rebates (PTR), and Inclined Block Base (IBB).

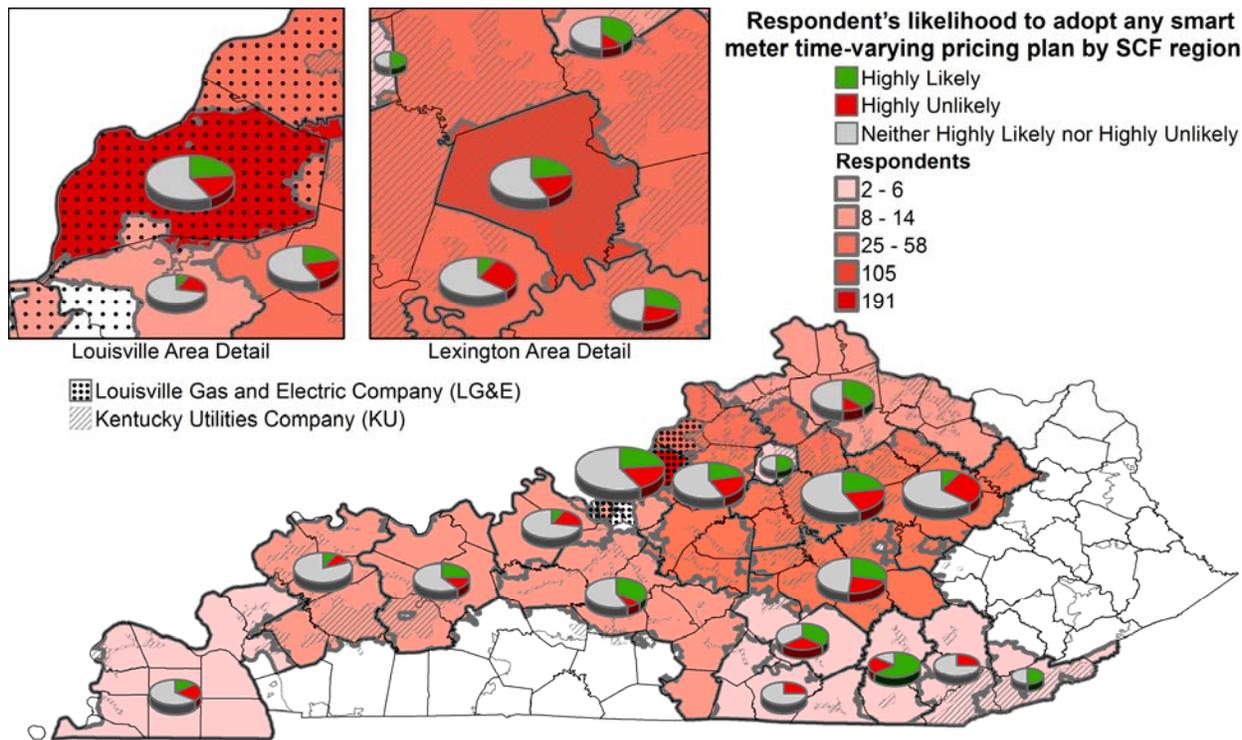


Figure 2: Geographic Distribution of Propensity to Participate in Time-Varying Pricing Plans

This map shows the areas of highest concentration of households that indicate a willingness to engage with Smart Meter-related pricing plans, most of which are in urban/suburban areas. These are also the areas that produced the largest number of survey responses. AMI is also typically less costly to deploy in urban/suburban areas compared to rural areas. Therefore, these areas are most likely to produce Smart Meter benefits for the utility and its customers who choose to engage in time-varying rate options if they were offered. Note, however, that customers who do not elect to engage would presumably not receive any direct benefits.

A second map below shows the five top areas by their urban-versus-rural designation where customer participation – and therefore benefits – would be expected to be highest, according to the data. The areas generally follow I-64 and encompass the greater urban areas of Louisville, Frankfort, and Lexington.



Five most likely SCF regions to participate in any time-varying pricing plan options (by count of responses)

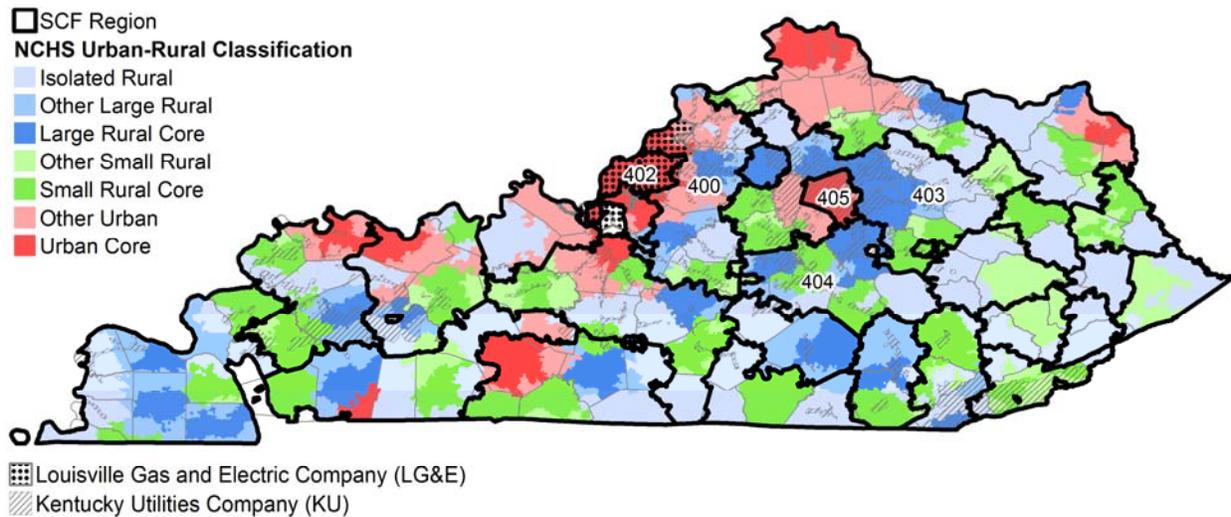


Figure 3: Top Five Areas of Most Likely Participation in Time-Varying Pricing Options with Smart Meters, by Urban/Rural Designation

These areas are also important from two other perspectives:

- Because of the higher concentration of people, outages in the urban/suburban areas affect more people;
- Urban/suburban Smart Meter deployment is less costly to carry out than conversions in rural areas

Given the correlation between these benefits with likelihood of household engagement, it is clear that a staged deployment of Smart Meters in urban/suburban areas presents the most advantageous strategy for LG&E and KU as based on our research.



2. Introduction

LG&E and KU are investigating the role of Smart Meters in advancing system reliability and relevance in a rapidly changing market while remaining a low-cost provider of electric and gas service in the region, and a respected and well-liked service provider to its customers. As such, the Companies have been investigating whether and how migration to a Smart Meter platform can best serve the needs of ratepayers and the communities in which they live and work while making good business sense to the Companies and their shareholders.

2.1 Background

The Companies have been engaged with the Kentucky Public Service Commission and various stakeholders since 2007 in considering the potential benefits and costs of Advanced Metering Infrastructure (AMI) or Smart Meter deployment and related service offerings. As part of this review, LG&E and KU conducted a pilot test from 2009-2011 of Smart Meters and pricing alternatives within a geographically targeted area of the service territory. The study tested the functionality of the equipment and provided findings regarding customer engagement with rate and enabling technology options, presented to the Commission in a final report (July 2012). In approving the cancellation of the pilot-tested rates, the Commission's Order encourages ongoing study into the efficacy and potential costs and benefits of further Smart Meter deployment. The Companies continued to investigate the most appropriate path for continued Smart Meter deployment; this report is part of that process.

2.2 Objectives of this Study

LG&E and KU engaged DNV KEMA to conduct a review of the current status and outcomes of Smart Meter activities based on the experience of the Companies, their peers in the region and nationally, with the objective of offering recommendations for appropriate next steps that the Companies should consider. This report presents the results of this research and our recommendations.

Specific research questions addressed in this study are:

1. Determine customer value and overall impacts on energy efficiency, energy bills and other potential outcomes through understanding customer perspectives and acceptance of advanced meter technology and dynamic pricing offers;
2. Develop an assessment of cost and capabilities associated with investing in new technologies on a full-scale, through pilot or targeted deployments, or other strategic direction;
3. Cost and benefits of integrating new technology with existing systems and the Companies' current IT infrastructure; and



4. Quantify the risk associated with investing while technology continues to emerge in metering, communications, distribution system, and data management systems.

The report summarizes multiple paths of investigation:

- Operational Considerations
- Customer Considerations
- Regulatory & Legislative Considerations

To address these areas of research, DNV KEMA conducted a series of informational interviews with LG&E and KU management to assess the landscape and corporate context within which the investigation was to take place. Key findings from the initial interviews and review of past documents reveal that, like many others in the utility industry, the Companies are evaluating how to approach Smart Meter adoption in a manner that is consistent with its corporate mission and philosophy to “deploy technology at the speed of value.”⁵ The companies have pursued a parallel path of internal research regarding the value of AMI coupled with keeping abreast of other pilot efforts and early roll outs nationally to examine lessons learned and how they might be applied in Kentucky,

To assess the customers’ perceptions of value from Smart Meter deployment, the Companies conducted two important investigations: a Commission-sanctioned Responsive Pricing Pilot (RPP) from 2009-2011, and a Residential Smart Meter Survey conducted by Bellomy Research, Inc. in 2011 (published in 2012).

2.3 Overview of Approach

DNV KEMA was hired to build upon the results of these two primary activities through a more comprehensive assessment of potential benefits and costs of advanced meter technology and recommended strategic direction for AMI deployment. To address these questions, DNV KEMA pursued the following overall approach:

- Independent review of existing data and experience
- Analysis of customer data from companies, records, surveys and secondary sources
- Identification of benefit streams and assignment of values where appropriate
- High level cost-benefit analysis
- Preliminary recommendations

⁵ Interview with David Huff, Director of Customer Energy Efficiency and Smart Grid Strategy for LG&E and KU.



2.4 Organization of the Report

The next section of this report describes our methodology and sources used in carrying out this investigation. This is followed by the body of the report as shown in Figure 4 with each section numbered to correspond with the Table of Contents.

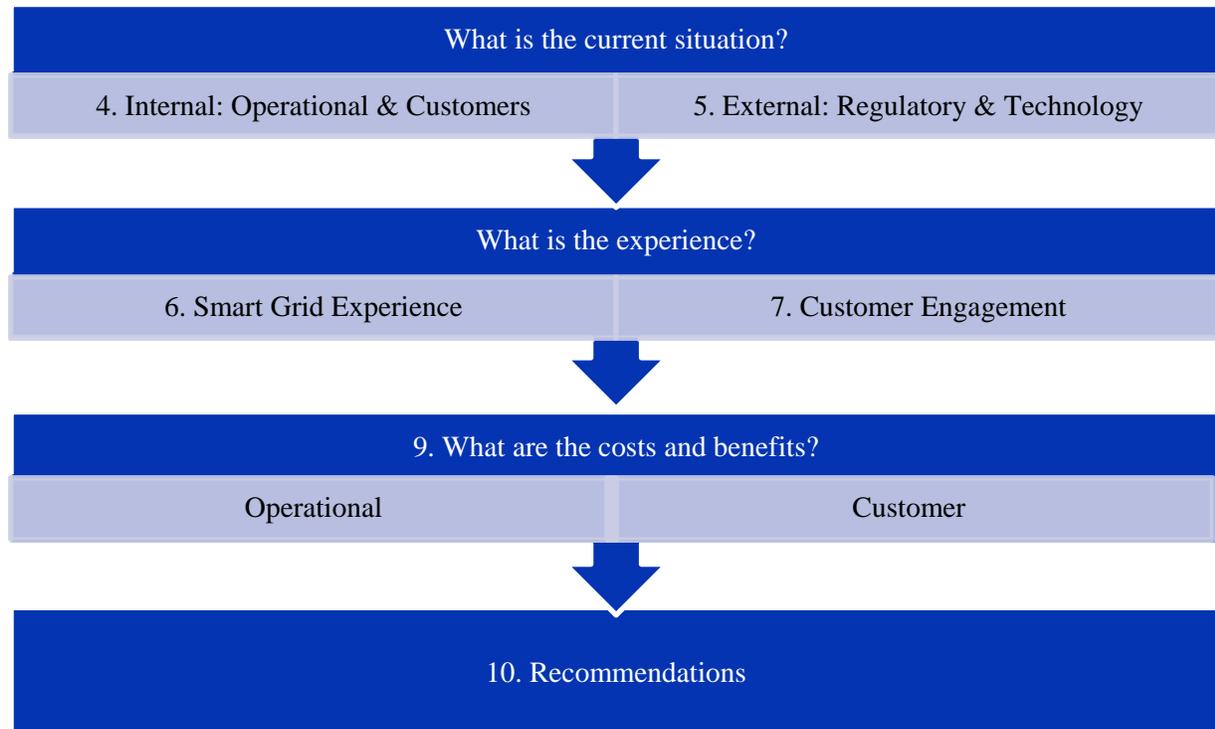


Figure 4: Report Layout



3. Methodology

3.1 Review of Sources

The study team relied on a combination of LG&E and KU specific data and reports, regulatory filings and documents, external industry reports, and secondary data sources such as the US Census.

3.1.1 Operational Analysis Sources

Primary sources of information used in the operational analysis include:

- Publicly available information from other utilities on their AMI business cases and deployments
- Private information from DNV KEMA through its involvement with numerous AMI deployments
- Information from groups within LG&E including the reliability, communications, distribution systems engineering, metering, field maintenance and operations dispatch, revenue assurance and other groups.

3.1.2 Customer Characteristics and Engagement Sources

Primary sources of information used in the customer characteristics and engagement analysis include:

The customer characterization examines specific characteristics of LG&E and KU customers and compares these statistics with regional and national statistics when applicable. When LG&E and KU data is not available, Kentucky or regional (Kentucky, Alabama and Mississippi) data are used as being the closest approximation of data to the service territories from available public sources.

The results from this section can be split into the LG&E and KU based results and the comparison results. The LG&E and KU statistics come from three distinct sources:

1. LG&E and KU customer data. This data source is the most reliable, coming from the utility customer database. DNV KEMA requested specific information and received aggregated results at the utility level and the zip code level for specified variables of interest to the Smart Meter investigation. Data were also examined from the Responsive Pricing Pilot (RPP) as a separate group for comparison to the overall population of LG&E and KU customers.
2. LG&E and KU's 2010 Residential Appliance Saturation survey. This survey was conducted as a phone and web-based survey. The phone portion was conducted by Strategic Marketing Research.



About 73 percent of the surveys were conducted as phone surveys, with about 27 percent being filled out online.

Bellomy Research's 2011 Residential Smart Meters Study. Bellomy Research conducted an online survey with 496 LG&E and KU customers with email addresses about Smart Meter awareness. The respondents to this online-only survey tended to be younger, more technologically advanced, and have higher levels of education than the general Kentucky population. Fifty-nine percent of respondents had a bachelor's degree or higher, compared to 22 percent of the larger Kentucky community as based on Census data.⁶ While biases in the survey design limit the ability to expand these survey results to the whole LG&E and KU population, it still presents an illustrative view of how this population views Smart Meter technology.

Regional and national level data help place the characteristics of the LG&E and KU customer base into a larger context. Knowing how a group compares with other groups that have implemented Smart Meter successfully or unsuccessfully can be useful in terms of planning. The data for the regional and national statistics come from two main sources:

1. Department of Energy's (DOE) Energy Information Administration's (EIA) 2009 Residential Energy Consumption Survey (RECS). The 2009 RECS had a sample size of 12,083, allowing for increased estimates at regional and state levels. The survey is administered only to primary residences. These are 2009 estimates, so they will not be exact comparisons.
2. Census Bureau's 2011 and 2012 American Community Survey (ACS). The ACS is a continuing statistical survey that samples and interviews a small percentage of the population every year.

3.1.3 Regulatory & Legislative Analysis Sources

DNV KEMA performed a review and analysis of key relevant research reports, regulatory filings, trade publication articles and other documents to develop the regulatory and legislative analysis in Section 5. This analysis also supported other conclusions in this report.

We sought to answer the following primary questions related to state and national regulatory and legislative treatment of Smart Meter:

- **Landscape.** What regulatory and legislative conditions exist currently in the U.S. and by state?
- **Impacts.** How may these regulatory and legislative conditions impact a LG&E and KU Smart Meter Business Case?

⁶ 2011 American Community Survey



To answer these questions, we undertook six major steps. These included:

1. Compiled documents related to regulatory and legislative treatments of Smart Meter investments from over 35 sources. These include, among others: US Department of Energy, National Association of Regulatory Utility Commissioners (NARUC), American Council for an Energy-Efficient Economy (ACEEE), EPRI, Edison Electric Institute (EEI), and industry trade groups such as the Smart Meter Alliance.
2. Reviewed and analyzed Kentucky PSC rulings and potential cost recovery strategies.
3. Reviewed and analyzed literature, trade and news articles, regulatory proceedings and orders, governmental reports, and other documents for national and other states.
4. Compared state-level Smart Meter related cost recovery strategies and determined impacts and potential implications for LG&E and KU.
5. Reviewed Kentucky PSC regulatory treatment of Smart Meter-related research and analyzed possible implications for LG&E and KU.
6. Discussed regulatory treatment options for Smart Meter-related investments and implications for LG&E and KU.



4. Internal Situational Analysis

This section presents a description of the current operational and customer/market conditions in which a Smart Meter business case is considered, followed by an overview of the infrastructure presently in place per the information gleaned from the companies' representatives.

Internal elements include those that can be directly engaged or influenced by LG&E and KU.

4.1 Operational Characteristics

Operational features of the utility system include physical facilities, equipment, hardware and software that are associated with the distribution of electricity to customers, and associated business functions such as customer billing, communications and reliability. All of these types of features would be impacted by a Smart Meter strategy. The primary focus of this report is on AMI. AMI has the most impact on customer related operations and distribution related operations. Hence for this report, we are limiting our review to a discussion of customer and distribution-related operations, and do not include transmission and generation functions.

LG&E and KU supply electricity and natural gas services to customers primarily located in Kentucky. The companies own and operate generation, transmission and distribution facilities.

LG&E supplies electricity and natural gas in the Louisville area, providing electric service to a service area of about 700 square miles. KU supplies electric service over a non-contiguous service area of about 6,600 square miles.

4.1.1 Meter reading system

Key components of utility operations that would be impacted by conversion to Smart Meter equipment are meter related functions, both in terms of the metering technology itself and the manner in which it is read or queried now and under a Smart Meter scenario.

At present 7 percent of the LG&E and KU meters are read using automated meter reading (AMR) - both drive by and walk by remote/wireless means - and the remaining meters are read manually, through a contract to a third party. LG&E and KU's average meter reading cost is below nationwide average.

In addition, LG&E and KU do off-cycle reads (i.e., when a customer moves out), disconnects/reconnects for non-paying customers and reads to validate misreads etc. These require field visits to the customer. Costs associated with these may be avoided or reduced by automating these functions.



4.1.2 Distribution System

The distribution system is the infrastructure from the substations to the meters (consisting of substations, feeders, distribution transformers etc.) over which the power is delivered to customers. The design, efficiency and reliability of this system determine the reliability and efficiency with which the power is delivered to the end consumer.

LG&E distribution substations are monitored and controlled using a Supervisory Control and Data Acquisition (SCADA) system. About 90 percent of the feeder circuits on the LG&E network are connected to other feeders via tie switches. LG&E serves mostly an urban/suburban area, and nearly 100% of load within the LG&E territory is presently monitored or controllable through SCADA communications.

In the KU network, many of the distribution substation feeders in the urban areas are connected to other feeders via tie switches; however, most feeders in the rural areas are not connected to other feeders. Thus, about 25 percent of these substations are on SCADA, however approximately 75% of load within the KU territory is presently monitored or controllable through SCADA communications.

At present, most of the devices on the feeders (i.e., capacitor banks, reclosers, regulators, switches, etc.) do not have communication capability; fewer than 20 reclosers on the feeders in the LG&E and KU network have communication capability. Improved communication to these devices would enable better monitoring and control, which may in turn permit improved reliability and reduction in technical losses.

4.1.3 Communication System

A Smart Meter network requires a robust communication infrastructure between the Smart Meters and the utility and between devices on the utility network and the control center.

The wide area network in LG&E is based on SONET rings (using OC-48 or being upgraded to OC-48). The core network in KU is based on collapsed OC-48 rings backed up by microwave.

Most of the substations on the LG&E network are served by the private fiber network (about 103 transmission and distribution substations are on the private network, 3 are using leased lines and several have no communication).

About 100 substations in the KU network are on the private network. About 50 distribution substations are served using 900 MHz MAS radio and about 76 are served using leased lines. There are also a large



number of substations in the KU network which have no communications (about 75 percent of the 433 distribution substations in KU do not have SCADA).

There are few devices on feeders that benefit from communications (about 10 on the LG&E network and about 3-4 on the KU network) limiting the ability to detect and remedy faults in an automated fashion and mitigate service impacting events. These devices are communicating using the 900 MHz MAS radio.

In addition to communications with distribution and transmission system elements, the Companies have communications with a significant number of direct-load-control switches installed at customers' premises. As of September 2013, LG&E and KU had 181,689 users on its Direct Load Control program. The service is presently supported by a 1-way paging system: the 2-way communication capability enabled by AMI may enhance the offering in the future.

4.1.4 Reliability

Improved system reliability is typically a benefit that is associated with use of smart grid technology. Reliability is defined through a variety of metrics, the most common of which are:

- SAIDI – System average interruption duration index
- SAIFI – System average interruption frequency index
- CAIDI – Customer average interruption duration index

The reliability indices are typically reported without MEDs (Major Event Days). The definition of MEDs is defined by an IEEE group to exclude days where the SAIDI value exceeds a calculated threshold.

The following are the reliability metrics (SAIDI, SAIFI and CAIDI) excluding MEDs for LG&E and KU for the last several years as reported to the Kentucky Public Service Commission.

Table 1: Annual Metrics for LG&E

	SAIFI	SAIDI	CAIDI
2012	1.15	97	84.0
2011	1.05	94	90.3
2010	1.22	105	86.7

They can be compared with the median values for SAIDI, SAIFI and CAIDI excluding MEDs for other U.S. utilities.

**Table 2: Annual Metrics for Other Utility Operators**

	Median SAIFI	Median SAIDI	Median CAIDI
Utilities in U.S. overall	1.31	146	111

(Tracking the Reliability of the U.S. Electric Power System: An Assessment of Publicly Available Information to State Public Utility Commissions (October 2008), LBNL Report 1092E n.d.).

Potentially AMI and other smart grid technologies could provide further improvement. The reliability metrics for LG&E and KU are better than the median values for U.S. utilities overall and for utilities in the East North Central U.S.

4.1.5 Outage Management

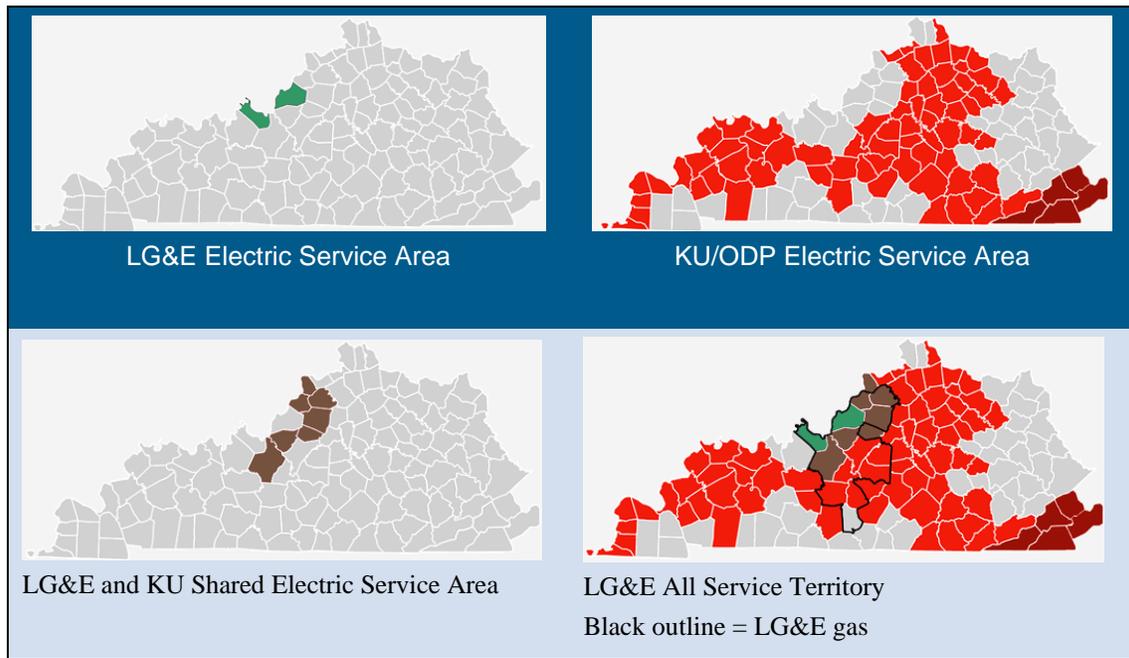
Another benefit of AMI is the ability for the system to provide real time information on the location and nature of faults and outages, and potentially to enable self-healing in the distribution system. This may reduce response time and using FLISR potentially limits the amount of field operations required to repair the system. Not having to rely on customers to call in outage information also potentially reduces the burden on call centers.

Both LG&E and KU each have a distribution control center. The information on incidents in the distribution system is currently obtained either from customer calls or from the SCADA system. The input is received in an outage management system (OMS) based on Oracle's Network Management System (NMS). The OMS then predicts the location of the incident based on the information received. A crew is dispatched to locate the incident and make appropriate repairs.

4.2 Customer Characteristics

While there are operational benefits that can be identified and associated with a Smart Meter strategy, utility customers will also be impacted in a variety of ways. It is therefore important to understand the existing characteristics of the Companies' customer base so as to identify potential customer benefits and challenges that may exist in regard to Smart Meter deployment. This section discusses various aspects of the LG&E and KU residential and small commercial customer classes with a focus on characteristics most indicative of potential response to Smart Meter related issues and/or service offerings.

Combined, LG&E and KU have about 791,000 residential customers and 108,000 commercial customers. KU has about 419,000 residential electric customers and LG&E has about 372,000 residential electric customers. Figure 4 shows the distribution of the electric and gas territories of LG&E and KU.



Source: LG&E and KU website (http://www.lge-ku.com/service_territory.asp)

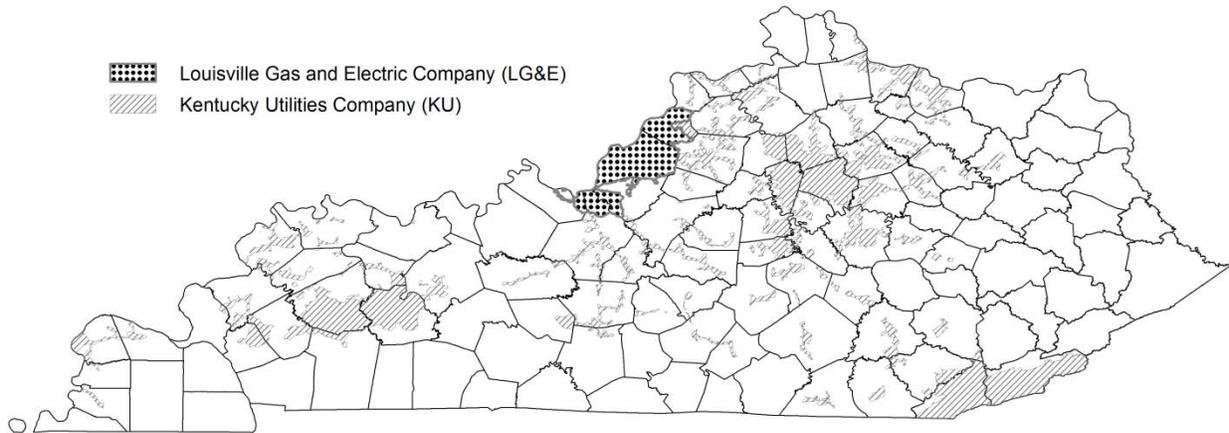


Figure 5: LG&E and KU Service Territory

4.2.1 Residential Customer Characteristics

We summarize the presence of characteristics in the LG&E and KU populations that are most indicative of Smart Meter engagement, as based on other studies and Smart Meter pilot programs. Results from the Smart Meter Pilot and Residential Smart Meter Survey show many factors affect interest in Smart Meters. This section explores general demographics that could affect uptake of a Smart Meter program in the residential sector.



Homeownership - The average LG&E and KU customer owns and lives in a single family home and uses more electricity than the national average household. Homeownership is at 68 percent, virtually the same as the national average.

Usage and Bills - The average annual electric bill for LG&E and KU customers is lower than the average bills in the region and nationally due to lower rates, even though their consumption is higher. Despite having lower electricity rates than most other states, the average annual electricity bill in the Kentucky, Alabama and Mississippi region is higher than the national average due to higher usage levels. The average household in the Kentucky, Alabama and Mississippi region uses almost 4,000 kWh more per year than the US average household.

Table 3: Electric Usage and Bill - Distribution

	LGE & KU*		Kentucky, Alabama, Mississippi		National	
	USD	kWh	USD	kWh	USD	kWh
Average	\$1,257	15,488	\$1,586	15,236	\$1,340	11,320

*Source: LG&E and KU customer billing records.

Interest in Bill Reductions - Customer expectations of direct monetary gains were the most cited benefit of Smart Meter related programs in both LG&E and KU and industry studies. However, the amount of savings expected on the bill for LG&E and KU customers is higher than the actual results from pilots. Fifty-one percent of respondents in the Residential Smart Meter Survey said they would want to see at least \$25 in savings per month to be interested in implementing Smart Meter technology.⁷ With an average monthly bill of \$104.75, that would represent a 24 percent savings, whereas the actual dollar savings experienced in the RPP was significantly lower due to lower levels of customer response.

Controllable Appliances - Between the two companies, LG&E customers have both a greater saturation of central AC systems (62 percent versus 24 percent for KU) and at least one of the three primary controllable appliances tapped in the Direct Load Control Program (66 percent), whereas KU customers are more likely to have two of the three controllable appliances than LG&E customers (45 percent versus 26 percent).

⁷ Question from Residential Smart Meter Study: “How much would you need to save on your monthly electric bill in order to change your behavior, such as adjusting your thermostat to sometimes less comfortable settings, changing the time of day you use appliances, etc.?”



Other Socio-demographic Indicators - Local research done after the pilot in 2011 indicates that the households most interested in Smart Meters tend to have higher levels of education, higher income, and are more technologically driven than the average household.⁸ The Residential Smart Meter Survey found that customers who agree with the statement “Technology makes my life easier” had a higher likelihood of participating in a Smart Meter program.⁹ This survey also suggested that among the respondent pool, once the program is explained to them, younger people tend to be more interested in Smart Meter programs.¹⁰

Customer Attitudes and Perceptions - Of those that responded to the Residential Smart Meter Survey:

- Twenty-seven percent reported being aware of Smart Meters. This varied both by age and income with younger and lower-income households being less likely to be aware of Smart Meters.
- When those who were aware of Smart Meters were asked about the advantages and disadvantages of Smart Meters, many people could not provide a response. Forty-six percent said they did not know of any advantages and fifty-nine percent said they did not know of any disadvantages.
- Advantages listed by at least five percent of the respondents included: ability to track electricity usage, conserve energy, save money, rate plans based on electricity usage. About eight percent said there were no benefits of Smart Meters.
- Disadvantages included loss of control, inaccurate/possibility of malfunction, uncomfortable temperature and lack of privacy. About 5 percent said there were no disadvantages of Smart Meters.

Participation in Energy Efficiency and Demand Response Programs –LG&E and KU already has several energy efficiency demand response programs, some voluntary or opt-in, and some provided to all customers with the caveat that they may opt-out if they wish (e.g., the Smart Energy Profile program). This information provides evidence of the propensity of LG&E and KU customers to take advantage of services related to energy use and costs similar to what might be offered as part of a Smart Meter strategy. Participation in opt-in programs ranges from 1 to 2 percent across 7 programs, with 5 percent

⁸ LG&E 2009 Smart Rate Program Assessment, Executive Summary Report; Bellomy Research, Residential Smart Meter Survey

⁹ Other statements that correlated with higher likelihood of participating in a Smart Meter program across different segments of the LG&E and KU populations included “Reducing Carbon Footprint”, “Low carbon energy is future”, “Consider myself green”, “Look for Energy Star Ratings”.

¹⁰ Younger respondents were less likely to be aware of Smart Meters when asked unprompted, but once the program was explained, they tend to like the program more than other segments. Conversely, while older respondents were more aware of Smart Meters, they liked the concepts less.



participation in the incentive programs. Direct load control is the program of choice for 23 percent of the residential customer class, representing the highest proportion of opt-in program participation. As an example of an opt-out service, a more recent behavior change informational program called Smart Energy Profile has been successful in retaining 99 percent of the original enrollees, or 42 percent of the residential customer sector.

The data analyzed in this section presents information on customer characteristics that are typically associated with Smart Meter acceptance and engagement. Most of the analysis centers on residential households since there are more data readily available for this sector from secondary sources, the pilot program, the residential survey, and the Companies' DSM program databases.

The data on customer characteristics suggests several results favorable to Smart Meter program acceptance: Among households with email addresses, there is a relatively high percent of smart phone use; 23 percent of households participate in the Demand Conservation Devices (Direct Load Control) program, and customers in a survey (again, households with email addresses on file with the Companies) were most interested in peak time rebates among four hypothetical time-varying rate options.

At the same time, there are also a few characteristics that are negatively associated with Smart Meter engagement as revealed in the data for Kentucky – e.g., there is a higher proportion of unemployed or retired households in the service territory (50.2 percent) as compared to regional and national data, and a comparable percentage of households with small children or elderly. These characteristics represent temperature sensitive groups and households with family members in the home during the day at peak time periods, where limited behavior change might be expected. Overall, one in four customers participates in some form of DSM. The vast majority of these participate in DLC (23 percent).

Finally, the percentages of households participating in LG&E and KU's DSM programs to date is from 2 percent for information and audit programs to 5 percent for the rebate programs, which is indicative of the interest levels in energy efficiency programs where customers voluntarily elect to participate. The exception is the Direct Load Control program, where 23 percent of residential households participate. It should be noted that these figures reflect the low energy costs in the region, and relatively low average bills that LG&E and KU residential customers pay.



5. External Assessment

External features are those that can impact a Smart Meter business case but are not within the direct control of the Companies. These include federal and State regulatory policies and market conditions, including technology developments. Federal and state legislation and regulatory policies are primary external features which can impact a Smart Meter business case that fall outside the direct control of LG&E and KU. We begin this chapter with a summary of regulatory research and analysis of federal and state level legislation and standards, Kentucky PSC actions and decisions and timeline, and implications for a Smart Meter business case in Kentucky. This is followed by a discussion of the applicable technologies and a summary of Smart Meter technology developments.

5.1 Regulatory and Legislative Policies

5.1.1 Federal Legislation and Standards

New federal policy or standards are not likely to impact a Smart Meter Business Case in Kentucky in the near term. We base this conclusion on several factors described in this subsection. Federal changes require relatively long lead times and recent FERC activity does not indicate this will occur in the next few years. For example, FERC declined to institute a rulemaking procedure on Smart Meter-related standards in 2011, and indicated it will not so do until specific conditions are met. One such condition is that relevant stakeholders reach sufficient consensus. As of 2013, there is no indication this has been achieved.

As background, two major relevant federal policies, enacted in 2005 and 2007, spurred state level regulatory activity in Kentucky and other states. First, the Energy Policy Act of 2005 (EPACT 2005) contained articulation of federal policy on electric metering. Second, the Energy Independence and Security Act (EISA) of 2007 addressed Smart Meter development to modernize the grid. The 2007 legislation directs FERC to:

“...institute a rulemaking proceeding to adopt such standards and protocols as may be necessary to insure Smart-Grid functionality... once it is satisfied that the work of the National Institute of Standards and Technology has led to ‘sufficient consensus’ on Smart Meter interoperability standards.” [Source: EISA § 1305(d), Public Law No. 110-140, 121 Stat. 1492, 1788 (2007) (to be codified at 15 U.S.C. § 17385(d))].

As noted, FERC did not find sufficient consensus for five types of standards in 2011, and terminated the docket while encouraging these stakeholders to reach consensus.



5.1.2 Kentucky Regulations

The Kentucky Public Service Commission is considering policies on AMI, Smart Meter and Dynamic pricing, while existing policies already adopted cover net metering and distributed generation. The Commission treats energy efficiency as part of Integrated Resource Plan (IRP). Table 4 summarizes the Kentucky PSC positions and decisions related to five major Smart Meter policy areas: AMI, net metering, distributed generation, energy efficiency, dynamic pricing, and interconnection standards. Table 5 presents Smart Meter related state regulatory and federal actions that impact Kentucky.

Table 4: Summary of Actions and Decisions Relating to Smart Meter in Kentucky

	Action	Authority	Summary	Date(s)
Advanced Metering Infrastructure (AMI)	--	--	Under consideration; see Case No. 2012-00428 for AMI and Dynamic Pricing.	--
Net metering	Legislation	SB 83 KRS §278.465 et seq. KY PSC Order 2008-00169	Follows eligibility rules for interconnection standards. limit 30 kW system capacity.	Enacted 4/22/2004 Amended 07/15/2008 01/08/2009
Distributed generation	--	--	See net metering and interconnection standards that affect DG systems.	--
Energy efficiency treatment	Legislation	Kentucky Revised Statute 278.285	Allows utilities to recover full costs of DSM programs through customer rates; legislation encourages cost-effective DSM programs.	1994
Dynamic pricing	--	--	Under consideration	--
Interconnection Standards	Legislation	<u>KRS § 278.465 et seq.</u>	Limit 30kW system capacity	enacted 04/22/2004 amended 2008



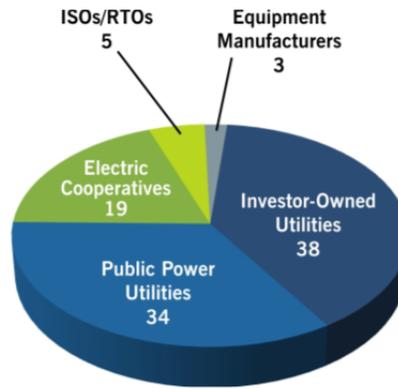
Table 5: Timeline of Smart Meter-related Federal and State Regulatory Actions Impacting Kentucky

Date	Federal / State	Action Taken	Summary
Oct 1, 2012	State regulation	KY PSC issues Order to study smart grid	Marked the third time since 2006 that the PSC has studied smart grids.
Mar 22, 2012	State regulation	KY PSC issues Order in Case No. 2011-00440	KY PSC approved discontinuing LG&E's Smart Meter Pilot and cancelling Rate RRP and Rate GRP tariffs.
Oct 6, 2011	State regulation	KY PSC adopts federal SG standards	Adopted one Smart Grid investment standard; declined to adopt four standards; deferred action on two others.
2009	Federal legislation introduced, referred to committee		Storage Technology of Renewable and Green Energy (Act of 2009) (s.1091)
Nov 13, 2008	State regulation	KY PSC opens Administrative Case No. 2008-00408	KY PSC's Administrative Case (No. 2008-00408) to address EISA 2007 - Smart Grid Investment
Oct 7, 2008	State regulation	Amendment - KY PSC	KY PSC's Order subsequently amended to allow General Electric employees to participate in the Smart Meter Pilot.
Dec 19, 2007	Federal legislation	EISA 2007 signed	The Energy Independence and Security Act of 2007 (EISA 2007) added four new Federal standards relating to SG (to existing PURPA Section 111(d)): (16) INTEGRATED RESOURCE PLANNING (Sec. 532(a)) (17) RATE DESIGN MODIFICATIONS TO PROMOTE ENERGY EFFICIENCY INVESTMENTS (Sec. 532(a)) (16) CONSIDERATION OF SMART GRID INVESTMENTS (Sec. 1307(a)) (17) SMART GRID INFORMATION (Sec. 1307(a))
Jul 12, 2007	State regulation	KY PSC issues Order approving LG&E pilot	KY PSC approved LG&E's 3-year Responsive Pricing and Smart Meter Pilot Program. Pilot included two tariffs: 1) the Residential Responsive Pricing Service tariff and 2) the General Responsive Pricing Service tariff.
Feb 7, 2006	State regulation	KY PSC opens Administrative Proceeding Case No. 2006-00045 to comply with federal legislation	KY PSC considers EPCAct 2005, Subtitle E requirements for smart metering (Section 1252) and interconnection (1254)
Aug 8, 2005	Federal legislation	Energy Policy Act of 2005 (EPCAct 2005) signed	Two sections relevant to Smart Grids: interconnection (Subtitle E, Section 1254) and time-based metering (smart metering) (Section 1252)

5.1.3 States' Smart Meter-Related Regulatory Treatment

Most state-level regulatory policy for Smart Meter-related activity was implemented in response to federal legislative requirements (e.g. EISA 2007 and EPACT 2005 as noted above). Subsequently, progress on grid modernization varies from state to state. For example, some states started Smart Grid related policy development before 2005, while other states have decided on other methods for developing demand response and advanced metering and did not strictly implement the EPACT requirement.

In response to EISA2007, LG&E and KU, as well as other comparable utilities in other states, developed and ran pilot programs incorporating advanced metering. The figure below shows the number of entities that have implemented pilots or full scale programs with US DOE funding, as of March 2012.



*Note: ISOs/RTOs = Independent System Operators and Regional Transmission Operators.

Figure 6: SGIG Projects by Type of Recipient¹¹

Map of Smart Grid Pilots and Deployments receiving Federal Funding¹²

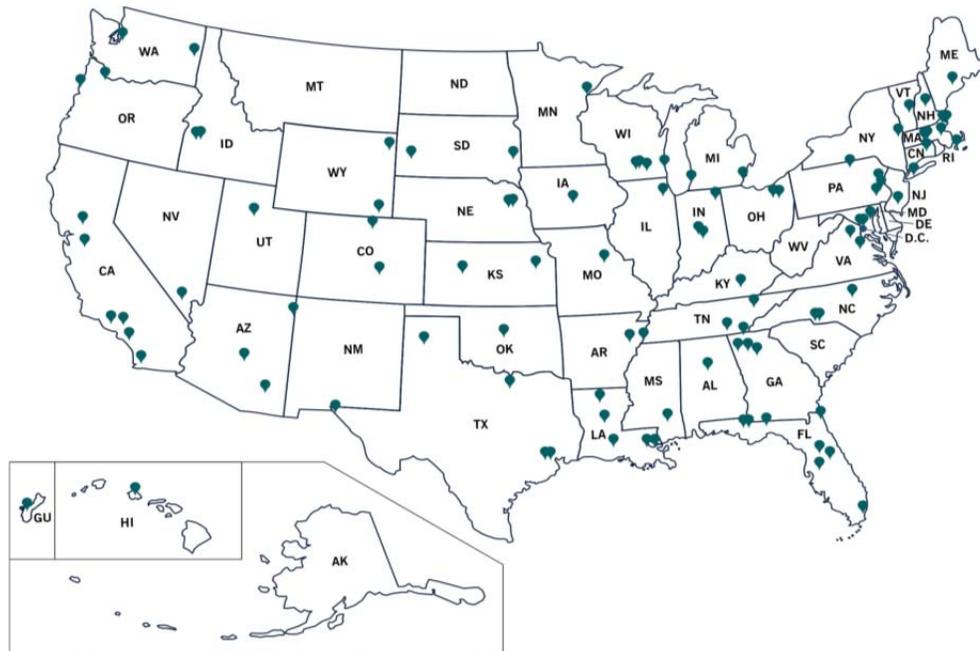


Figure 7: Federal Funding of Smart Grid

¹¹ US DOE – SGIG, July 2012.

¹² US DOE- SGIG, July 2012



5.1.4 Advanced Metering Legislation & Regulation

In this section, we consider regulatory actions for six key Smart Meter-related activities and treatment at the state level. These include: Advanced Metering Infrastructure (AMI); net metering; distributed generation; energy efficiency treatment; dynamic pricing; and interconnection standards.

These activities are important considerations for a utility Smart Meter-related Business Case. Rules, standards and regulations for these activities may impact utility motivations for Smart Meter investments, cost recovery issues, and customer participation.

- **Advanced Metering Infrastructure (AMI).** Approximately 46 million Smart Meters have been installed as of 2013 (constituting about 40 percent of U.S. households), according to a report from the Institute for Electric Efficiency dated August 2013.¹³ This includes states primarily in the Northeastern, Southern, and Western U.S. Kentucky has conducted pilot programs using AMI technologies.
- **Energy efficiency and demand response program treatment.** Energy efficiency programs are encouraged by the Kentucky PSC, with cost recovery available through the rate process. To the extent that Smart Meters facilitate participation in energy efficiency and demand response programs, they may be impacted by this regulatory treatment. Kentucky utilities are not required to operate energy efficiency or DR programs, but many do include DR as part of their DSM program suite.
- **Interconnection Standards.** Interconnection standards are an important consideration for owners of renewable generation systems and lay the foundation by establishing processes and technical requirements for grid connections. . Kentucky has PSC-approved interconnection standards which apply to net-metered systems.

¹³ Report accessible at: http://www.edisonfoundation.net/iee/Documents/IEE_SmartMeterUpdate_0813.pdf

Advanced metering legislation & regulation

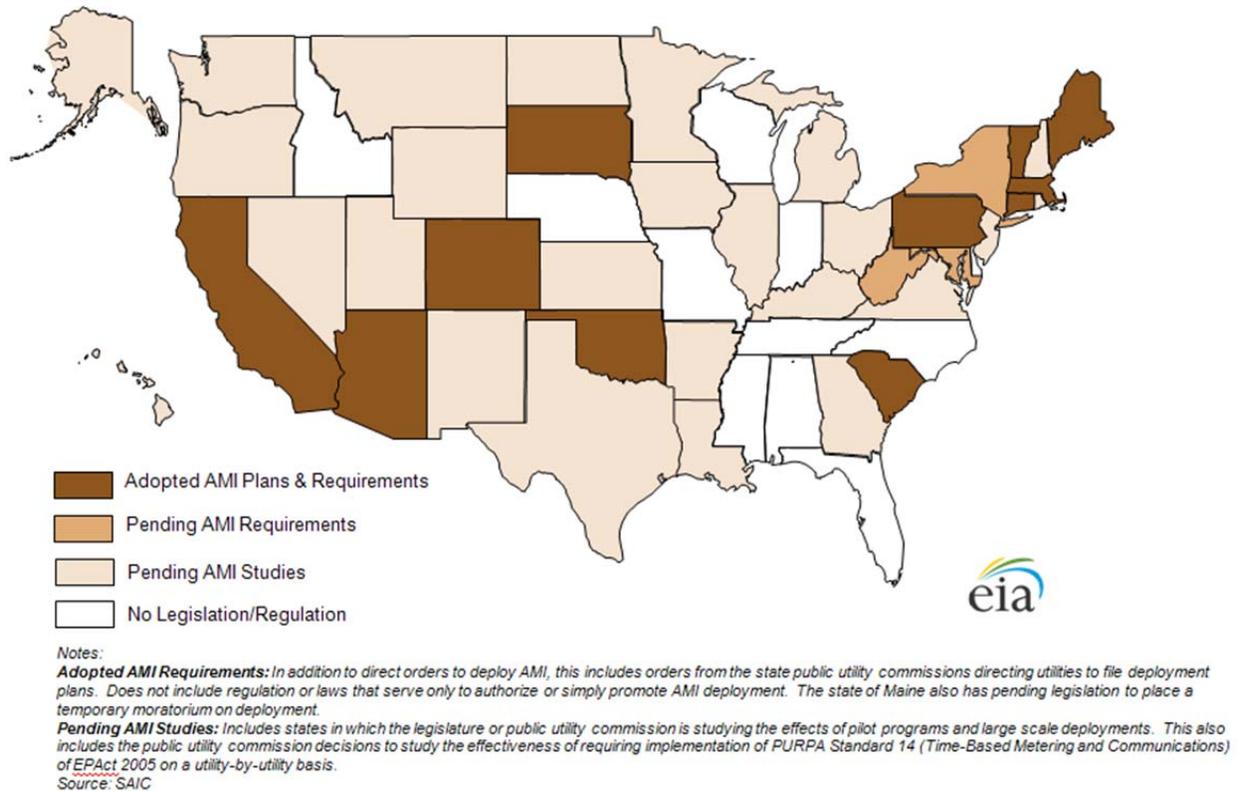


Figure 8: Status of AMI Legislation and Regulation (2011)

5.2 Applicable Technologies

5.2.1 Advanced Metering Infrastructure (AMI) and Smart Meter

LG&E and KU selected and installed the equipment for their Smart Meter pilot in 2007. The Smart Meter and AMI market has matured significantly since then. At present a number of vendors offer AMI solutions including Landis+Gyr, Itron, Elster, Silver Spring Networks and Sensus.

AMI enables 2-way communications with the meters. This can be done via a variety of communication technologies including wireless, cellular and power line communications (PLC). A typical architecture for an AMI system is shown below.

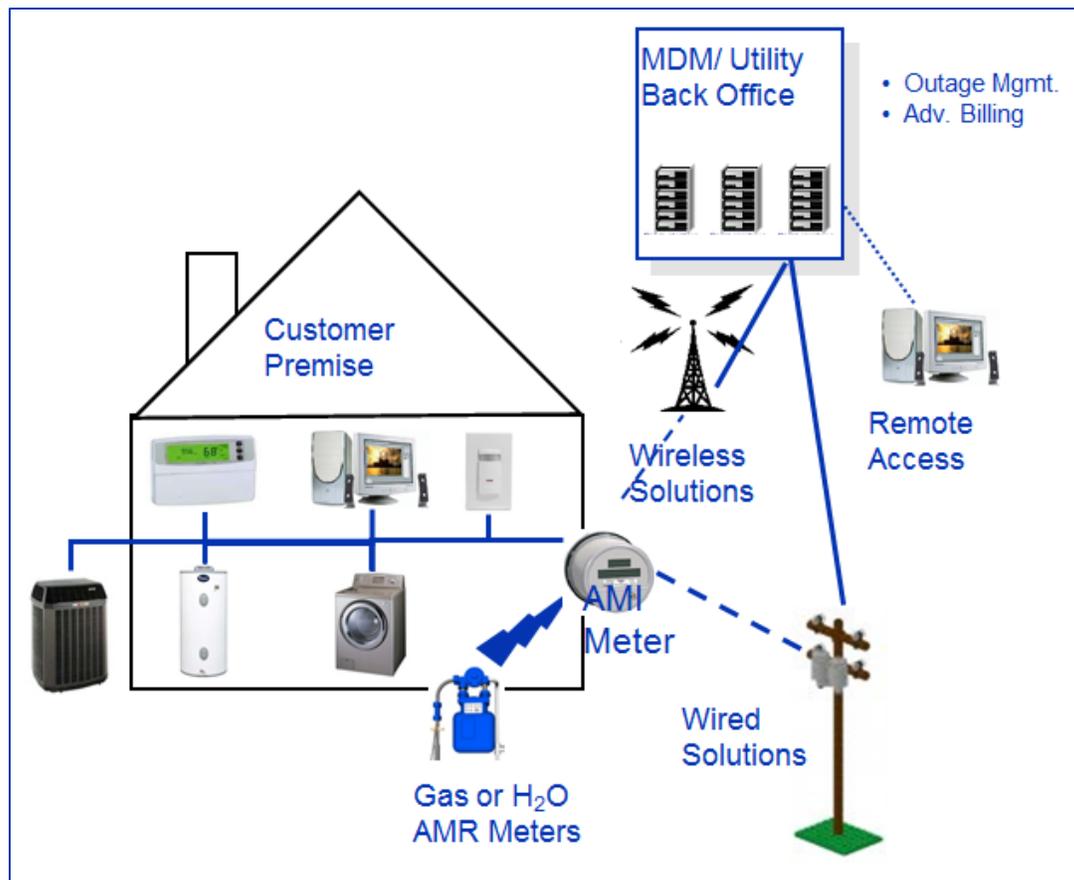


Figure 9: Typical AMI Architecture

In the RF mesh architecture, the data is routed from meter to meter via wireless until it reaches an access point. From the access point, the data is backhauled to the utility data center using fiber, cellular, or other communications method. At the utility data center, the data may be managed using a meter data management system. The meter may also communicate with in-home devices such as in-home displays, smart thermostats using either wireless technologies such as ZigBee or PLC.

There are several applications enabled by AMI. These include:

- Remote meter reading – typically meters send back 15 minute interval data about 4-6 times daily;
- Time of use billing – PTR and TOU rates are enabled because the utility receives interval usage data;
- Power quality monitoring at the meter – in addition to energy usage data, the meters can report back voltage quality. This can be used by the Distribution management system (DMS) for Volt/VAR control and for automatic reporting of power quality issues;



- Power outage detection and restoration – the meters can send outage messages which can be used by the OMS to reduce outage detection time and also potentially to more accurately identify the location of the outage; power restoration to the customer can be confirmed by pinging the meter;
- Remote connect/disconnect and rate limiting – connection and disconnection of service can be done remotely;
- Reducing non-technical losses and unaccounted for energy via tamper detection, more accurate billing, identification of dead meters, etc.;
- Direct load control and demand response – utility may send individual load control and demand response messages to customers using the 2-way AMI communication network
- Providing energy usage information to customers –daily energy usage information can be provided to the customer on a website or smart phone;
- Data analytics using the collected load data for load forecasting, contingency analysis, asset monitoring, etc.;
- Support for PEVs though TOU billing ;
- 2-way communication infrastructure to support other applications including distribution automation, demand response and DERs.

5.2.2 Distribution Automation Technologies

There may be a number of devices installed on the distribution feeders:

- Voltage regulators
- Capacitor banks
- Reclosers
- Fault Circuit Indicators (FCIs)
- Switches/Sectionalizers

Distribution automation is enabled by communications to the devices which permits alarms and other data collection from devices and allows the devices to be controlled. Among the distribution automation applications are Fault Location Isolation and Service Restoration (FLISR) and Volt/VAR control. The system can be controlled via a Distribution Management System (DMS).

5.2.3 Fault Location Isolation and Service Restoration (FLISR)

FLISR is used to improve feeder reliability. FLISR detects a fault on the feeder section based on information received from breakers, FCIs, etc., and isolates the faulted feeder section by opening switches and then restores service to the unfaulted feeder sections – potentially serving them from alternate substations. FLISR has the potential to improve reliability by reducing SAIFI, SAIDI, CAIDI, etc.



5.2.4 Volt/VAR Control

Volt/VAR control is used to reduce network losses via use of capacitor banks, maintain an optimum voltage profile along the feeder and reduce peak load through feeder voltage reduction by controlling the transformer tap positions in substations and voltage regulators on feeders.

5.2.5 Distribution Management System (DMS)

The DMS provides a graphical display of the distribution system to the operator. It can support a number of applications including:

- FLISR – fault location, isolation and service restoration – autonomous reconfiguration upon faults – results in some customers suffering momentary rather than sustained outages;
- Volt/VAR control – coordinating settings on capacitor banks, voltage regulators and transformer tap settings to reduce losses while maintaining power quality constraints;
- Load modeling and load forecasting – estimate distribution network loading and load forecasting;
- Distribution state estimation – using measured data and potentially historical load profiles
- Calculation of reliability indices such as SAIFI, SAIDI, CAIDI and MAIFI;
- Optimum feeder reconfiguration – determines the optimal feeder configuration to minimize losses;
- Contingency analysis – analyze potential switching and fault scenarios;
- Relay protection coordination.



6. Smart Meter Experience

6.1 Operational Results

In its report to the Kentucky Public Service Commission in April 2011, LG&E and KU reported that 99 percent of electric meters and 69 percent of the gas modules in its Smart Meter pilot were reporting energy usage on a regular basis. LG&E also reported that “non-reporting meters continue to be generally related to foliage issues, location of meters and occasional hardware malfunctions.”¹⁴

LG&E also reported that it has gained “valuable insight into the operations of network infrastructure in rural areas. In particular, LG&E has learned that network performance can be improved through deployment of additional signal repeating equipment to overcome natural barriers such as foliage and distance between meters and communication gates.”¹⁵

These insights will be valuable in any future deployments, though some of the observed issues and problems may no longer be applicable as the AMI equipment and technology has significantly matured since 2007.

6.2 Customer Engagement Results

6.2.1 Responsive Pricing Pilot Results

The RPP pilot was designed primarily to gain experience in the functionality of the AMI equipment in selected geographies in close proximity to LG&E headquarters in Louisville, as well as to gauge customers’ responsiveness to different rate structures with different combinations of AMI equipment. The pilot also provided valuable initial feedback as to potential customer engagement issues.

LG&E noted the rapid emergence of new metering technologies in the marketplace, although they required additional study. Insights were also gained regarding related equipment requirements in rural areas, and the relative cost effectiveness of such investments.

¹⁴ Responsive Pricing and Smart Metering Pilot Program Annual Report for Louisville Gas and Electric Company, April 1, 2011.

¹⁵ Ibid

**Table 6: Maximum Summer Average Load Reductions (kW) by Pilot Study Subgroup (2010)**

	Maximum avg. kW reduction at hour 15:00 (2010)	Change in kWh Usage June – Sept months (2007-2010)	Total Billed Cost June-Sept (2010)
Pilot Group	0.98 kW reduction	+18 percent Year 1 -14 percent Year 2 +10 percent Year 3	\$516.08 (4 months of summer bills)
Comparison Group:	0.54 Demand Conservation Participants*	n/a	\$523.66
Incremental benefits	0.96-0.54 = 0.42 (44 percent more peak load reduction than DLC)	None observed	\$7.58 (1.4 percent bill savings)

Source: Based on EM&V analysis conducted by Good Cents on 90 RPP and 1400 control customers.
*Comparable degree days from 2006.

The subgroup within the pilot program participants that demonstrated the most responsiveness to the TOU and CPP price signals was the GE group, where the combination of smart appliances and the Responsive Pricing signals produced the highest reduction in demand on the system.¹⁶

The average monthly bill for all LG&E residential customers combined is approximately \$104.75. The pilot group, located in an urban/suburban area, showed an average bill for the summer months of \$129.02 per month (\$516.08 divided by 4 months). Among this higher bill paying group, the savings realized were 1.4 percent of the bill. This means that on average, if all LG&E customers performed in the same manner as the pilot group in terms of responsiveness to the rate signals, they could be expected to save \$1.47 per month on their summer electric bill.

Table 7: Summer 2009 Changes in Bills for Participants

Customer segment of the pilot group	percent change in electric bill
Average bill savings across all participants:	-1.40 percent
Top 11 percent saved more than:	-6.00 percent
Lowest 6.5 percent paid an increase of:	10.00 percent
17 percent were bill neutral (0 change):	0.00 percent
Percent drop-out rate (<i>i.e. non-participants</i>):	11.00 percent

¹⁶ April 1, 2011 report (page 15)



6.2.2 Smart Meter Customer Awareness Survey

Building upon the pilot results, and to get a wider understanding of the potential levels of interest in Smart Meter services, LG&E and KU conducted a web-based survey of a statistically valid sample of customers across the service territory, drawing from those for whom the Companies had email addresses and thus have Internet access. This survey provides additional important feedback regarding potential customer reactions to Smart Meter offerings among those who are already actively engaged in the Internet. Results of the survey are discussed in Section 7.

6.3 Experience Elsewhere

This section provides a summary of the AMI costs and operational benefits as reported by other utilities (details are provided in the Appendix D). The utilities surveyed were AEP Ohio, Duke Ohio, Ameren and NES. Results are also presented from the Smart Grid Consumer Collaborative (SGCC) report on Smart grid economic and environmental benefits which summarizes the results from a number of utilities.

6.3.1 AMI Costs

Utility	AMI Costs
AEP Ohio	\$180 per customer plus yearly O&M costs
Ameren	\$273 per customer over 20 years (additional costs of \$376 for IT System and integration)
NES	\$188 per customer plus additional yearly O&M costs
SGCC Study	\$291.54 plus 4 percent yearly O&M costs

6.3.2 AMI Operational Benefits

The operational benefits presented here are primarily those related to AMI and do not include benefits due to Volt/VAR control and FLISR which would require additional investments.



Utility	AMI Operational Benefits (per customer per year)
AEP Ohio	\$15.65 - \$19.01
Duke Ohio	\$11.05 - \$14.73
Ameren	\$36
NES	\$35.92
SGCC	\$24.50 - \$46.48

6.3.3 Customer Engagement Comparative Results

Actual enrollment rates for smart meter services nationally track just above 80% for opt-out programs and just below 15% for opt-in programs. The national opt-in rate is generally in line when compared to LG&E and KU's experience with the RPP (13.5% enrollment for LG&E and KU versus 11% national average recruitment rate for opt-in smart meter programs).¹⁷ Evidence shows, however that LG&E and KU customers have significantly lower levels of awareness and knowledge or understanding of benefits of smart meters as compared to a national survey of residential customers.

6.3.3.1 Federal Studies

There have been several Smart Meter pilot and early deployment programs that can be used as evidence of potential customer engagement. Two recent studies of projects funded by the federal government that summarize several programs are referenced here:

- US Department of Energy, Analysis of Customer Enrollment Patterns in Time-Based Rate Programs: Initial Results from the SGIG Consumer Behavior Studies (July 2013).¹⁸

¹⁷ Responsive Pricing and Smart Metering Pilot Program Annual Report for Louisville Gas and Electric Company; April 1, 2011

¹⁸ The U.S. Department of Energy (DOE), Office of Electricity Delivery and Energy Reliability (OE), is implementing the Smart Grid Investment Grant (SGIG) program under the American Recovery and Reinvestment Act of 2009 (Recovery Act). The SGIG program involves 99 projects that are deploying smart grid technologies,



- US DOE, Voices of Experience: Insights on Smart Grid Customer Engagement (2013) ¹⁹

The U.S. Department of Energy (DOE), Office of Electricity Delivery and Energy Reliability (OE), is implementing the Smart Grid Investment Grant (SGIG) program under the American Recovery and Reinvestment Act of 2009 (Recovery Act). The SGIG program involves 99 projects that are deploying smart grid technologies, tools, and techniques for electric transmission, distribution, advanced metering, and customer systems. DOE-OE is examining the progress, impacts, and benefits of these projects and is presenting the results on www.smartgrid.gov.

From the July 2013 report noted above, a wide range of enrollment results are in evidence: Of 19 solicitation efforts across the range of SGIG consumer behavior, sign up rates ranged from 5 percent to 28 percent for opt-in offers, and 78 percent to 87 percent retention from opt-out offers.²⁰ Average acceptance for opt-in programs is 11 percent.²¹ These data show that actual enrollments often do not align with estimates of likely participation.

tools, and techniques for electric transmission, distribution, advanced metering, and customer systems. DOE-OE is examining the progress, impacts, and benefits of these projects and is presenting the results on www.smartgrid.gov.

¹⁹ Prepared for the U.S. Department of Energy by National Renewable Energy laboratory under contract No. DE-AC36-08G028308, Subtask SG10.1011 in conjunction with Energetics Incorporated under contract No. GS-10F-0103J, Subtask J3806.0002.

²⁰ US DOE – SGIG report, page 18.

²¹ US DOE - SGIG report, page iv.

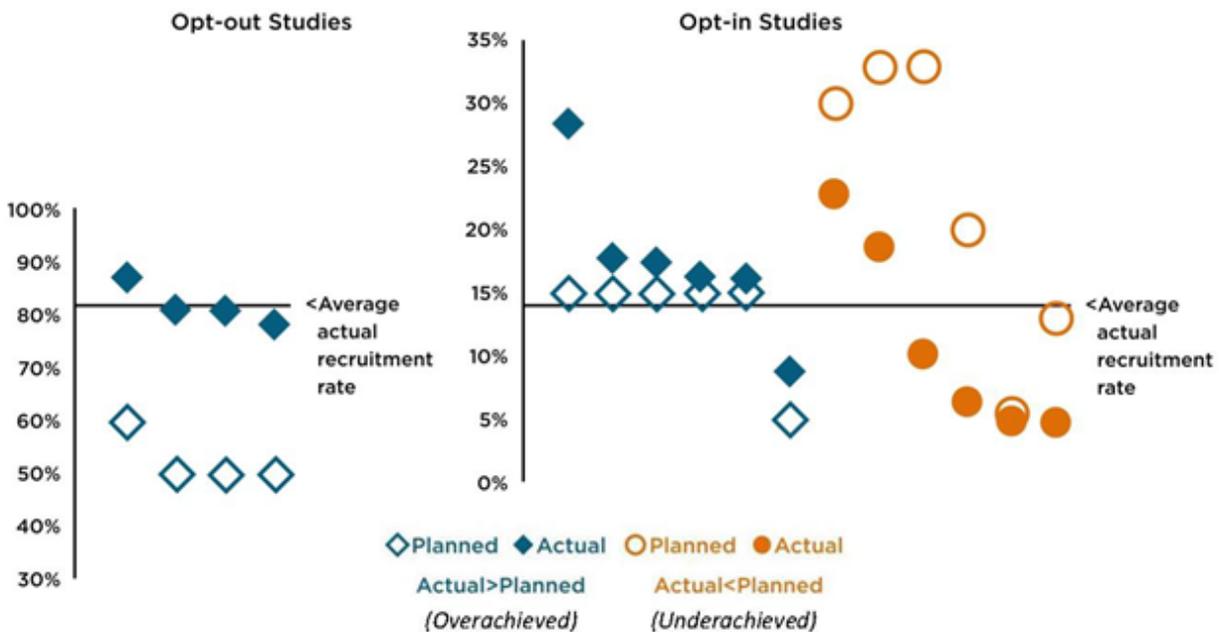


Figure 10: SGIG Enrollment Results

6.3.3.2 Utility Industry Studies

In parallel with the federal government, the utility industry has led several collaborations investigating smart grid and smart meter feasibility. Two significant ones that have involved researching customer reactions are the multi-utility Smart Grid Consumer Collaborative (SGCC) and the Electric Power Research Institute's (EPRI) Smart Grid Demonstration Initiative.²² The website for SGCC indicates that the "Smart Grid Consumer Collaborative (SGCC), is a 501(c)(3) nonprofit with the mission of accelerating the adoption of a consumer-friendly, consumer-safe and consumer approved smart grid." It consists of membership from utilities, non-profit groups, governmental groups, technology providers, vendors and industry consultants.

DNV KEMA was interested in comparing the reactions of LG&E and KU customers on smart meter issues to customers from other areas of the country, to see how they differ. We identified a national survey on residential customer awareness of and reaction to smart meters that involved residential customer respondents from across the US, over 1000 in total.

²² EPRI Smart Grid Demonstration Initiative, 5 Year Update (2013)



The following table compares LG&E and KU's Smart Meter survey results to those of a national survey of residential customers regarding Smart Grid awareness and interest conducted by the Smart Grid Consumer Collaborative.²³

Table 8: SGCC Smart Grid Awareness Survey Results

SGCC National Survey Wave 3 (n=1089) (Aug – Sept 2012)	LG&E and KU Smart Meter Survey (n=496) (Dec 2011)
<p>Consumer awareness of smart grid has remained relatively consistent over the last two years – 54% of respondents never having heard the term “smart grid”, 52% never heard of “smart meters” While 48% have heard of smart meters, 19% don’t know what it means</p>	<p>Awareness (unaided) of smart meters is very low - 73% have no knowledge of it</p> <p>Of the 27% who indicate awareness, 54% could not identify a benefit (no benefit or don't know)</p>
<p>54% of respondents who are aware of smart grid and its benefits are supportive, consistent with earlier “waves” of the survey</p>	<p>35% of those who are aware of smart meters could identify at least one potential benefit; Likelihood to participate, once a description was read, was 59% overall</p>
<p>• Both programs have lower interest in the most recent survey (Wave 4). CPP – from 63% down to 59% likely would participate TOU – from 49% down to 46% likely would participate</p>	<p>Likelihood to participate percentages in two rate programs comparable to the SGCC study are: CPP – 38% TOU – 43%</p>
<p>Conclusions from SGCC Wave 3 report:</p> <ul style="list-style-type: none"> • So far, increased Smart Grid/Meter implementation nationwide has not made a meaningful difference in the Consumer Pulse findings on awareness. • These technologies continue to be off the public’s radar screen to a surprising degree. • Although most of those who do know about Smart Grid tend to support it, too few understand the technology and its potential benefits. 	<p>Conclusions from LG&E and KU Smart Meter Survey:</p> <ul style="list-style-type: none"> • Smart meter awareness (unaided) is low with less than one quarter of customers having heard of it. • Understanding of potential benefits is low with 65% unable to identify a benefit

²³ SGCC; Consumer Pulse and Segmentation Research, Wave 4, November 12, 2013



While the surveys for these two studies were not designed to be directly comparable, these data still reveal some very stark differences between national average attitudes and intentions regarding smart meters and those of LG&E and KU customers. Most revealing among these statistics is the difference in awareness – with a 20 percentage point difference in awareness among LG&E and KU customers (73% unaware versus 52% nationally); of those who have heard of smart meters, (27% LG&E and KU versus 43% nationally); 54% of LG&E and KU customers could not name a benefit (versus 19% nationally not understanding what it means). Finally, while Critical Peak Pricing offers are the most popular options both among the national sample and LG&E and KU customers, intended participation rates for the utility are significantly lower than nationally reported intentions – (38% LGE and KU versus 59% nationally). Intentions toward Time of Use rates are more closely aligned.

These findings illustrate the higher hurdle that LGE and KU would have to overcome to engage their residential customer sector in smart meter related programs. Indeed, the pilot RPP program spent considerably more in marketing and outreach to achieve lower actual enrollments than anticipated (28% had been planned for – 565 customers out of 2,015 with meters installed in the pilot program area; only 13.5% were actually enrolled – 274 customers out of 8,109 households were meters were installed).

6.3.3.3 Regional Utility Experience

Two companies in Kentucky received federal grant money to pursue Smart Grid projects, including pilot tests of AMI deployments. The US DOE website SmartGrid.gov provides results as of the date of this report from the various projects for which funding was received. However, neither of these companies has reports linked to the site as of the time of this report, nor were either of these two utilities highlighted in the US DOE report on enrollment patterns discussed above. We are therefore unable to obtain an update of actual enrollment status and performance results through publicly-available sources. The two projects are described below.

Duke Energy has a Smart Grid Deployment project that involves AMI and distribution automation systems in five states including Kentucky. They received federal funding for a part of this investment and have reported on results to the US DOE. The project tested customer response to time-of-use rates, peak-time rebates, and critical-peak pricing and have involved home area networks, web portals, and direct load control devices to evaluate their ability to reduce their electricity consumption and peak demand.²⁴ Data on Duke's program is not broken out by state, so we were unable to obtain publicly-available information as to progress in the Kentucky portion of the utility services territory.

²⁴ USDOE, Smart Grid Investment Grant Program, July 2012, Page b-18



The **South Kentucky Rural Electric Cooperative Corporation**'s (SKRECC) opt-out project includes Smart Meters, enhanced communications infrastructure, in-home displays, and direct load control devices. The system allows customers to view their energy consumption through the customer web portal and in-home displays, among other services.²⁵ According to the DOE website SmartGrid.gov, the utility has 61,500 residential customers on the existing flat rate and has just over 1,500 customers in the Direct Load Control program. Time varying rates and in-home displays or other control devices are not being used at this time.²⁶

²⁵ USDOE, Page b-46.

²⁶http://www.smartgrid.gov/project/south_kentucky_rural_electric_cooperative_corporationadvanced_metering_infrastructure_deploy



7. Customer Engagement

7.1 Overview

DNV KEMA undertook a data mining analysis to uncover insights regarding customer engagement with LG&E and KU utility programs/offerings, by stitching together components from internal LG&E and KU billing/customer data, public domain ACS data, RASS data, and Residential Smart Meter data.

The objective of this analysis was to examine the variation in observed outcomes such as enrollment in opt-out programs, opt-in programs, and likelihood of participation in rate plans by potential explanatory factors such as demographics, attitudes, and other customer data such as energy usage, technology adoption etc.

In order to conduct such an analysis, we require and use disaggregated data. In lieu of individual level data, we use 5-digit zip code-level information provided to us by LG&E and KU and combine this with data from other sources such as the American Community Survey for an enriched understanding of the customer.

This section details the results of the following analyses:

- Propensity to Participate in Pricing Plan (based on Residential Smart Meter Survey data alone)
- Propensity to Participate in an Opt-in Program (based on LG&E and KU customer data and ACS data)
- Propensity to stay enrolled in an Opt-out Program (based on LG&E and KU customer data and ACS data)

Appendix B presents the detailed methodology for the background analysis. The conclusion of this analysis is that these data suggest that LG&E and KU will have a challenging chance of success in regard to customer engagement at three levels:

- Signing up for a program on an opt-in basis; or
- Staying in a program that is offered on an opt-out basis only; and
- (for either group) Actually responding to price and information signals by shifting or altering energy usage.

We describe the basis for our findings below.



Opt-In Program

The customer characteristics that most closely are associated with Opt-In behavior are:

- [Positive] education (prevalence of college education/bachelor's degree),
- [Positive] size of residence (number of bedrooms), and
- [Positive] home value (median home value of owner occupied housing units).

This means that the more educated the homeowner, the larger the number of bedrooms and the higher the home value, the more likely they are to participate in voluntary or Opt-in program offers associated with energy efficiency or demand response. It should be noted that the factors above may be confounded with other factors (also examined in our analysis) such as income, employment status, number of household members etc. The variables listed above are relatively better at capturing the variation in the outcome variable (participation in an opt-in program such as DLC) in a numeric model. They should be viewed as indicative of the types of variables that influence energy consumption and related behavior. For example, the number of bedrooms variable listed above is different from, but also related to, the square footage of the home, or the number of bathrooms, or the total number of rooms. These other variables were considered and discarded as they do not add anything more to the explanatory power of the model than the final set of variables listed above.

Opt-Out Program

The customer characteristics most closely associated with remaining in an Opt-Out program are:

- [Positive] Prevalence of owner occupied homes
- [Positive] Energy Consumption
- [Positive] Size of residence (number of bedrooms)
- [Negative] Prevalence of single member households
- [Negative] Prevalence of email (per LG&E and KU customer records)

This means that the propensity to stay enrolled in an opt-out program increases overall with an increase in the prevalence of owner occupied homes, increased energy consumption, and larger residences. On the other hand, prevalence of single member households and email are inversely related to the propensity to stay enrolled in an opt-out program.

It should be noted that these relationships are not necessarily causal. For example, perhaps email facilitates opting out easily or at any time of the day without reliance on a customer service representative during office hours. But, it could also be that one way LG&E and KU captures email addresses of customers is when they opt out of a program. It should also be noted that the relationship between the



explanatory variables and the outcome is relatively weak in the analysis of opt out programs compared to the model above examining opt in programs (direct load control).

In summary, while neither the opt-in nor the opt-out model prove causation of the outcome, a predictive model for an opt-out program will require the addition of other variables to explain customer propensity to opt-out as LG&E and KU and ACS data do not suffice. We may hypothesize that other attitudinal motivators might be driving this behavior versus in the case of an opt-in like a DLC program where it might be a more straightforward desire to reduce consumption/size of bill and this is directly correlated with the size/value of the home and the amount of knowledge the consumer has about such programs..

Pricing Plan/Rate Program

From the survey research on the likelihood of participating in a rate program (like the four options presented in the Residential Smart Meter Survey) under a Smart Meter initiative, it appears that LG&E and KU could anticipate around 22 percent of customers to respond to an offering, if intentions as reported in the survey translate into enrollments. Since that is not typically the case, one could consider 22 percent to be an upper bound of potential. Almost 100 percent of those who indicate a high interest in all 4 of the rate programs (22 percent of the sample) state that they are highly motivated to make changes to their energy usage and save money with Smart Meter programs. Approximately 51 percent of this highly responsive group has smart phones (10 percent of the sample are highly responsive to rate programs and have a smart phone).

7.2 Propensity to Participate in Pricing Plans

The objective of this analysis is to explore customers' propensity to participate in pricing plans such as Time of Use (TOU), Critical Peak Pricing (CPP), Peak Time Rebates (PTR), and Inclined Block Base (IBB) as a function of explanatory variables such as customer usage, demographics, attitudes, technology adoption and other factors.

7.2.1 Data Sources

The data sources available and considered for this analysis include:

- **LG&E and KU Customer data** - Customer information summarized at the 5 digit zip code level obtained from LG&E and KU
- **RASS data** - Individual level responses to the Residential Appliance Saturation Survey (RASS) conducted amongst a sample of LG&E and KU customers
- **ACS data** - Public domain information sourced from the American Community Survey and summarized by DNV KEMA for the 5 digit zip codes that fall within its service territory



- **Residential Smart Meter Survey data** -Individual level responses to a web-based survey amongst customers in LG&E and KU service territory with email addresses on file with the Companies.

We first analyze propensity to participate in any rate offerings of a Smart Meter program using the response data base from the Residential Smart Meter Survey conducted by Bellomy Research, Inc. in 2012. Table 9 presents a summary of utility customer likelihood of participating in a Smart Meter rate offering based on a “likelihood” score created by DNV KEMA, and then by specific rate type (taken directly from the survey results).

Table 9: Percent of customers responding to Smart Meter Rate Options

	Likelihood to participate in [4,3,2,1,0] rate offerings Constructed based on responses to 4 rate types					Rate Types - % 4 or 5 on a 1-5 scale				Sample size
	Highly Likely	Somewhat likely			Highly Unlikely	Time of Use	Critical Peak Pricing	Peak Time Rebate	Inclining Block	
	4	3	2	1	None	TOU	CPP	PTR	IB	
LG&E	24%	24%	19%	17%	16%	60%	55%	71%	38%	216
KU	21%	20%	20%	20%	20%	52%	44%	70%	38%	280
Total	22%	22%	19%	18%	18%	55%	49%	70%	38%	496

Source: Residential Smart Meter Survey, Bellomy Research, Inc., 2012

It must be noted that customer intent as reported in a survey does not directly translate into action. Studies show that among those who indicate interest in a rate offering, 5-10 percent will typically actively engage.²⁷

7.2.2 Geographic Analysis

The Residential Smart Meter Survey captures responses from 496 customers residing across 122 distinct zip codes. This wide-ranging survey asks respondents about their attitudes towards energy efficiency, their motivations to conserve energy and save money, the perceived benefits and disadvantages of the Smart Meter etc. The survey data received by DNV KEMA also includes merged monthly and annual (November 2010 – October 2011) actual bill information regarding electricity and natural gas usage at the

²⁷ EPRI Smart Grid Demonstration Project Overview and Results & Lessons Learned, October 10, 2013 presentation. http://psc.ky.gov/PSCSCF/2012%20cases/2012-00428/20131009_PSC_Memo.pdf



respondent level and demographics such as income, age, household size, education level, appliances in the home and usage habits etc.

The survey also asks respondents to indicate on a 1-5 scale, where 5 means highly likely to participate and 1 means highly unlikely to participate, their likelihood to participate in TOU, CPP, PTR and IB pricing plans.

As the best acceptable proxy measure available in any of our data sources for propensity to adopt time-differentiated rate plans, we construct a compound indicator of likelihood to adopt rate plans based on responses to all four questions on participation in pricing rate plans as follows. If the respondent is highly likely (4 or 5) to participate in all four pricing plans then they are assigned a score of 4, else if they indicate high likelihood to participate in three of the four plans they are assigned a score of 3, and so on. Respondents who do not indicate likelihood to participate in any of the four plans are assigned a score of 0. This yields 5 groups/segments of respondents of near equal size ranging from 18 percent to 22 percent with vastly different propensity to participate.

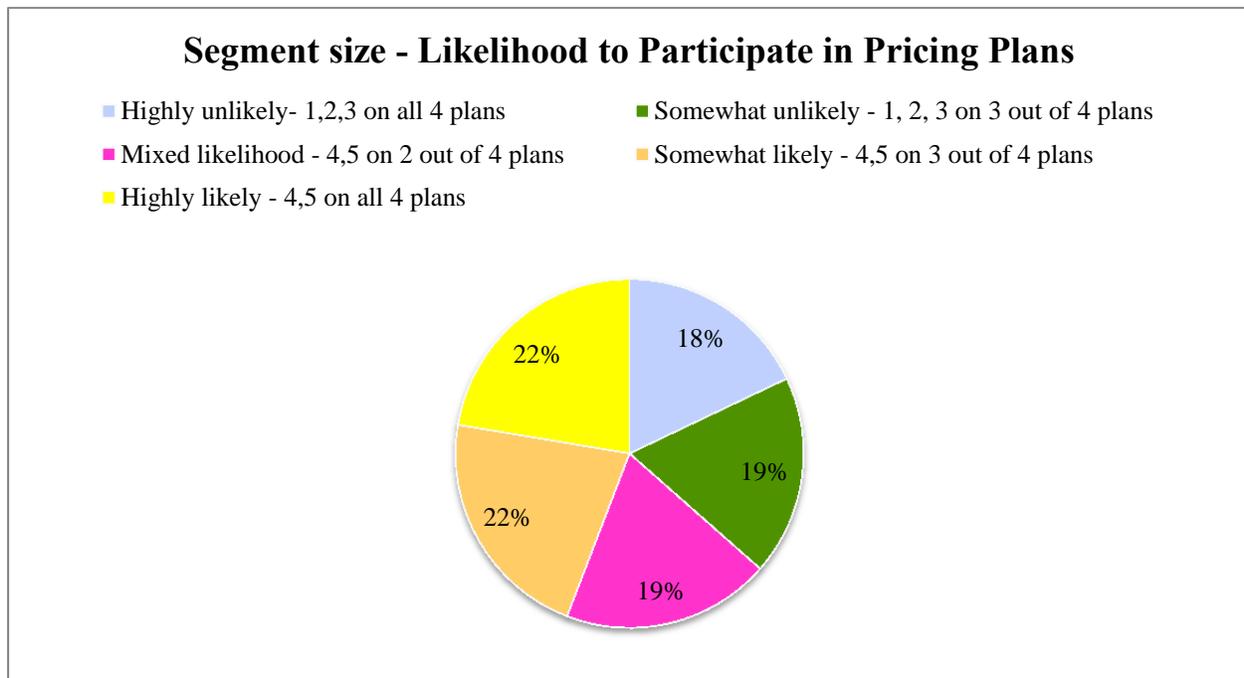


Figure 11: Likelihood to Participate in Pricing Plans - Segment size/share of total

The survey data used in this analysis has sparse data in some areas at the 5 digit zip level, with as low as a single observation from a zip code. In order to overcome this sparse data problem, we create larger

geographical groupings based on the 1st 3 digits of the zip code called Sectional Center Facility or SCF, which is simply a definition we borrow from the USPS as a device in order to conduct an analysis on the geographic distribution of our propensity to participate in pricing plans segments. For example: The Louisville area is served by SCFs 400, 401, and 402. The 122 zip codes across the 496 Residential Smart Meter survey respondents may be collapsed into 17 SCFs (see Appendix C for table of groupings and the number of responses in each one). The figure below is a visual representation of the geographic distribution of propensity to participate in time-varying rate plans with Smart Meters, overlaid on the LG&E and KU territory.

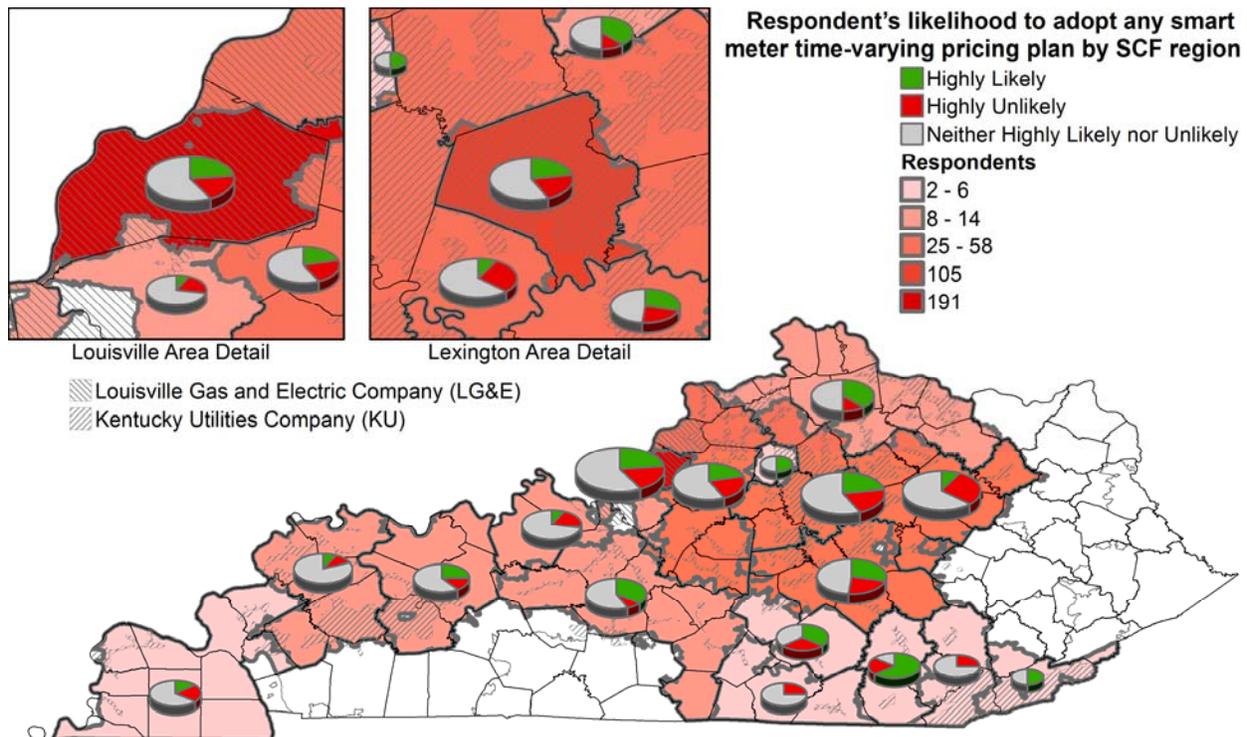


Figure 12: Geographic Distribution of Propensity to Participate in Pricing Plan Segments

While we still have low sample size for some SCFs, even after collapsing records to the SCF level, we note from the figure above that there might be some pockets of concentrated interest in these pricing plans (for example: the southeast corner on the map above).

A second map below shows the five top areas by their urban-versus-rural designation where customer participation – and therefore benefits – would be expected to be highest, according to the data. The areas generally follow I-64 and encompass the greater urban areas of Louisville, Frankfort and Lexington.

Five most likely SCF regions to participate in any time-varying pricing plan options (by count of responses)

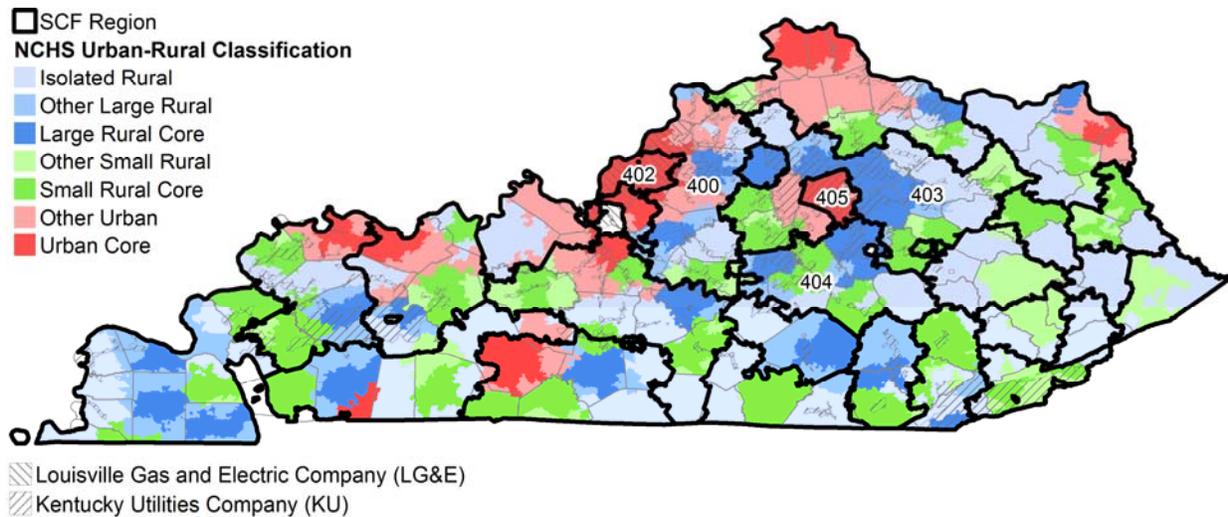


Figure 13: Top Five areas of Most Likely Customer Engagement in Time-Varying Rate programs

7.2.3 Customer Profiles

Each of these 5 segments is also profiled by utility, energy consumption, attitudes towards energy efficiency, income, age, perceived benefits and disadvantages, household size etc. We can examine these data to develop a profile or picture, if you will, of the typical customer in each likelihood group.

- **“Highly Likely” Customer Profile** – 22 percent of customers are highly likely to participate in all of the 4 pricing plans (TOU, CPP, PTR, IBB) under a Smart Meter program, as based on the survey results. The characteristics of the household that is most likely to respond favorably to a Smart Meter rate offering are relatively lower average electricity usage, higher prevalence of programmable thermostats, higher concurrence on considering themselves “green”, higher agreement on having a low carbon footprint and moving towards a low carbon future. There is no (0 percent) prevalence in this segment of those who agree that Smart Meters have no benefits.
- **“Highly Unlikely” Customer Profile** - 18 percent of households surveyed are not likely to participate at all in any Smart Meter program. This household looks similar on the surface to the highly likely customers on aspects such as education with almost 60 percent of both groups possessing a college degree, cell phone ownership, smart phone ownership, and internet access but they have divergent attitudes on energy and technology. This household has relatively higher gas usage, is willing to pay for comfort, and thinks reducing usage is



unimportant in higher numbers than other segments. They consider checking devices a nuisance although they currently have the similar levels of phone and internet prevalence as other segments. Almost one in four (23 percent) agree that Smart Meters have no benefits or are not interested in Smart Meters.

- **“Somewhat likely” Customer Profile** - The majority (60 percent) of respondents to the survey indicated positive intentions toward one to three of the four rate offerings described as being part of a Smart Meter program. While these households vary considerably in terms of socio-demographics and attitudes, a composite profile can be described as follows: They lie in the middle between the “highly likely” and the “highly unlikely” with respect to their attitudes toward conserving energy, saving money, reducing their carbon footprint etc. They have the highest electricity and gas usage relative to the other two segments described above, the highest prevalence of those with income over \$50,000 (66 percent for this segment versus 49 percent and 46 percent for the above two respectively), and relatively the lowest Smart Meter awareness.

7.2.4 Detailed Findings

Those who are highly likely to participate and the least likely to participate in time-varying rate plans may be described by the following characteristics:

- The highly likely segment constitutes 22 percent of those surveyed and this is approximately the size of the remaining segments along the likelihood spectrum as well. Size in descending order of likelihood is 22 percent, 22 percent, 19 percent, 19 percent, and 18 percent
- While, there is a relatively higher prevalence of KU customers (53 percent) than LG&E customers (47 percent) in the high likelihood to participate segment, their share of the highly unlikely segment is the highest of all 5 segments at 62 percent KU customers versus 38 percent LG&E customers.
- They have the lowest electricity usage (Total annual usage from November 2010 to October 2011) at 15,248 KWH versus the other segments that range from 16,620 KWH to 19,800 KWH
- They are the most likely to have a programmable thermostat (58 percent) along with the immediate next segment of likelihood (57 percent) versus the lowest likelihood segment (52 percent)
- Smart Meter awareness is relatively higher amongst the group with the lowest likelihood to adopt any of the 4 pricing plans (34 percent) than the group with the highest likelihood (27 percent)
- On average, the least likely to participate also score relatively lower (average on a 1-5 scale) on whether they consider themselves green (3.0) versus the most likely to participate (3.6).



- The least likely to participate has a high score (3.1) on willingness to pay for comfort versus the most likely to participate suggesting that this segment will not be as persuadable by the potential for savings from Smart Meter program pricing plans.
- The most likely to participate has a relatively higher score on wanting to reduce their carbon footprint (4.1) versus the least likely to participate (3.3) and moving to a low carbon future (4.1 versus 3.4 respectively)
- The least likely to participate also has a relatively higher agreement on the statement that reducing usage is unimportant than the most likely to participate (2.4 versus 1.6)
- The least likely to participate scores relatively higher than the most likely to participate on their belief that climate change is hype (2.7 versus 2.2 respectively).
- The most likely to participate concur to a higher degree that technology makes life easier (4.3) versus the least likely (3.9).
- The least likely to participate also has a relatively higher score than the most likely to participate (2.7 versus 2.1) on the statement “checking devices is a nuisance”.
- Smart phone ownership, cell phone ownership and internet access have relatively comparable prevalence amongst the least likely and most likely groups (53 percent vs. 51 percent, 93 percent vs. 96 percent, 96 percent vs. 97 percent respectively) suggesting that while technology access is at the same level, attitude towards technology varies as noted in the preceding points.
- The ability to save money on Smart Meter programs motivates relatively more of those in the highly likely to participate segment (30 percent) versus those in the least likely segment (10 percent).
- A relatively higher number of the least likely to participate segment believe uncomfortable temperatures are a disadvantage due to some Smart Meter programs than those in the highly likely to participate segment (10 percent vs. 3 percent, respectively)
- Likelihood to participate in Smart Meter program pricing plans is highly correlated with the motivation to make changes and save money on Smart Meter program pricing plans. The most likely to participate segment scores relatively higher (3.9 on a compound indicator ranging from 0-4) than the least likely to participate segment which has near zero motivation (.3 average on a 0-4 scale). Propensity to participate in an Opt-in program

LG&E and KU has provided DNV KEMA with aggregated customer information at the 5 digit zip code level across 361 zip codes in its service territory on the total number of customers, total number of customers participating in a direct load control program who have demand conservation devices in their home, the total number of customers who are still enrolled in an opt-out comparative home energy report program (Smart Energy Profile), customers with email access, energy consumption in KWH, percent enrolled in bill pledge, and customers who are confirmed/likely owners versus renters.



7.3 Opt-in versus Opt-out Results

DNV KEMA modeled propensity to participate in Opt-in as well as Opt-out programs; the methodology and detailed results are provided in Appendix B. The top five variables that most closely explain Opt-in and Opt-out propensity are as follows.

Opt-in behavior is modeled from data on customers who elected to participate in the Direct Load Control program as indicative of potential Smart Meter participation. Table 10 presents the top five explanatory variables for Opt-in behavior as based on these data.

Table 10: Explanatory Variables for Opt-In Behavior as based on DLC Participation

Data Source	Label	Correlation with DLC PCT
ACS	percent Bachelor's degree	0.7
ACS	Median home value - owner occupied	0.7
ACS	percent Masters or higher	0.7
ACS	Median family income	0.6
LG&E and KU	percent with email	0.5

These results suggest that customers meeting the same profile as above would be potentially good candidates for Opt-in Smart Meter related programs.

A second analysis was done on Opt-out behavior as based on the Smart Energy Profile program participation, where all residential customers were initially enrolled, and customers wishing to be removed from the program could make that request. Table 10 presents those results with the top 5 explanatory variables and their correlations; Table 11 elaborates on those who elected to stay in the program (e.g., not opt-out). One can see that the correlation of variables is weaker here than in the analysis above.

**Table 11: Top 5 Variables for Opt-In Behavior as based on SEP Participation**

Data Source	Label	Correlation with percent still enrolled in an opt-out program
ACS	percent Owner occupied homes	0.3
LG&E and KU	Average electricity consumption	0.2
ACS	Median number of bedrooms (as a measure of house size)	0.2
ACS	percent Employed	0.2
ACS	Year home built	0.2

7.4 Conclusions

We hypothesize that there might be other behavioral factors related to motivation, attitudes towards/against energy efficiency etc. that might have an impact on the decision to opt-out. While we do have some of this data from the Residential Smart Meter Study and RASS surveys at the 5 digit zip level, even aggregating records up to the SCF level leaves us with sparse cells and some zips and/or SCFs with fewer than 10, and in some cases, as few as 1-5 households representing the whole zip.

We are unable to put information from all four sources of data together due to the sparse “n” that underlies the data at the 5 digit zip/SCF level for the surveys. This means that while we can conduct inferential analysis at the total level based on survey data, analysis at a disaggregated zip or SCF level is not interpretable. For example, while the work presented in this document includes original research on the Residential Smart Meter Survey Data alone, any combined multivariate analysis has been using LG&E and KU and ACS data.

Additional primary research to gather survey data based on a representative sample of customers from each zip (or the majority of zips that LG&E and KU is interested in studying) and building upon the above work for more insight into drivers of participation in pricing plans, opt-out programs, opt-in programs might be beneficial.



8. Gap Analysis

A recent report by the Smart Meter Consumer Collaborative indicates that there are several factors that will heavily influence the potential for a successful business case for Smart Meter:

1. Customer participation levels in Time-Varying Rates, Prepayment and Customer Energy Management;
2. Utility operating characteristics pre- and post-investment, including electric energy and capacity costs;
3. The speed with which operating cost reductions can be translated into lower rates;
4. Utility regulation and governance issues and their impact on the realization of benefits, particularly treatment of lost revenues due to reduced sales volumes.

A high level gap analysis is provided in the graphic below, which indicates our conclusion of how LG&E and KU compare to these four areas of a business case strategy.

**Table 12: Gap Analysis Highlights**

	Current State	Gap	Fully Automated AMI/Smart Meters
Operational Conditions	At present most of the reading is done manually by a meter reader; most meter field service such as disconnect/reconnect, off cycle reads require a field visit by a technician; there is very little distribution automation or communication to the field devices.	Installation of AMI in locations of the service territory where operational conditions are such that the benefits outweigh the costs.	Use of AMI to enable meter reading automation and automation of meter field services; backend system using MDMS, OMS and DMS. Field devices enabled using distribution automation.
Customer Conditions	Customer participation in opt-in programs ranges from 1-5 percent for energy efficiency and 23 percent for DLC. Participation in opt-out programs is strong with 99 percent of original enrollees still participating	No gaps are apparent for opt-out behavior when using SEP as a proxy; however RPP pilot program results showed a drop-out rate of 60 percent (of 200 enrollees there were 80 remaining customers) ²⁸ ; Propensity to participate voluntarily shown as likely to be between 10 and 20 percent according to study results.	Achieve industry average of approximately 83 percent retention for opt-out program or 15 percent recruiting for opt-in program
Regulatory Conditions	Rules of engagement under consideration	Clarification of specific elements of cost recovery; agreement as to an evaluation plan for justifying claims results, achievement of key metrics	Cost recovery of Smart Meter investments including related ongoing maintenance, customer programs and services

²⁸ Responsive Pricing and Smart Meter Pilot Program Final Results for Louisville Gas and Electric Company, Case no. 2007-00117; July 1, 2011.



8.1 Operational Status and Requirements

Table 13: Operational Conditions Gap Analysis

Feature	Current State	AMI/Smart Grid
Meter reading	Current done manually and using AMR (93 percent of the meters are read manually and 7 percent using AMR)	Using AMI
Connection / Disconnection of services	Currently done manually	Using AMI
Distribution operations	SCADA at only 25 percent of the KU distribution substations but controlling 75% of load; no distribution automation or communication to field devices	SCADA to distribution substations; distribution automation and communication to field devices
Volt/VAR control	No communication to field devices	Communication to field devices; use of a DMS; Volt/VAR control to reduce energy use
Outage management	Based on customer calls	Information from outage messages from Smart Meters; sensors in the field and customer calls
Call center operations	Based on customer calls	AMI enables ping of the customer meter; knowledge of outage before customer call; ability to locate outages more quickly

9. Assessment of Costs and Benefits of AMI

This section provides an analysis of the costs and benefits of AMI. The discussion follows the three categories outlined below in Figure 16 as representative of the typical types of benefits considered in developing business cases for Smart Meter around the industry.

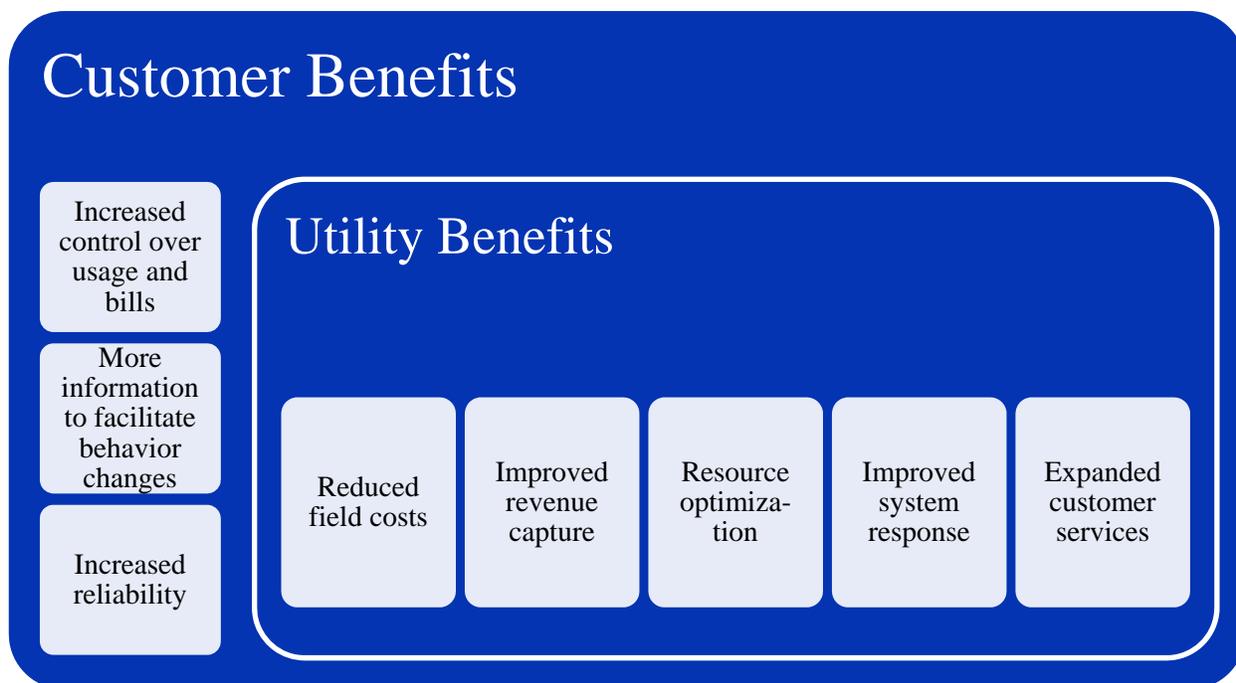


Figure 14: SG Benefit Categories

Customer benefits have not been quantified for this analysis, though several recent sources of information have been published regarding early experiences from federally funded and other pilot programs. Further, some of the customer benefits are not easily monetized (such as perceptions of increased reliability) and are the subject of ongoing research in the industry.

9.1 Utility Costs and Benefits

The AMI costs are a summary of the costs that DNV KEMA has seen in its involvement with AMI deployments and from publicly available information from other utilities on their AMI deployments. The costs we use are a summary of costs from AMI RF mesh deployments and AMI Point-to-multipoint deployments. The AMI benefits are based on discussion with different groups at LG&E and KU.



We provide a quantitative discussion of the benefits due to meter reading automation and other meter services (such as remote connect/disconnect and off-cycle reads). For the other benefits of AMI such as improved outage management, reduction in unaccounted for energy etc., we provide a qualitative discussion.

The cost-benefit analysis is based on Net Present Value (NPV) analysis. The time horizon for the business case is taken to be 20 years which is similar to the AMI business cases done by other utilities (most utilities have used either used 15 year NPV analysis or a 20 year NPV analysis – examples of several utilities are given in Appendix D). We use an escalation rate of 2.1 percent for labor and other costs (based on an average of the inflation rate for last 5 years). For the NPV analysis, a discount rate of 3.4 percent was used (based on the current 20-year Treasury bill rate).

9.2 Costs

The costs are based on deploying AMI to LG&E and KU's 945,000 electric customers. Deployment of AMI for gas meters is not considered in this report.

9.2.1 Initial Costs

The initial costs are for the deployment of meters, network infrastructure, backend systems along with associated integration and program management costs, estimated for a full deployment scenario across the LG&E and KU service areas.

**Table 14: Initial Costs – Full Deployment**

		Total Cost
AMI Meter	\$100 - \$120 per meter	\$95M - \$114M
Meter Installation	\$20 - \$35 per meter	\$19M - \$33M
Network Infrastructure	RF – mesh (assuming 2 repeaters and 1 collector per 1000 meters) - \$7K - \$12K for 1000 meters PMP – (assuming 1 base station per 4000 meters) - \$10K - \$15K per base station	\$2.5M - \$11M
Network Infrastructure installation	RF – mesh (\$1500 - \$2500 for 1000 meters) PMP – (\$8K - \$10K per base station; in addition there may be costs for leasing tower space etc.)	\$1.5M - \$2.5M
Head-end / MDMS	\$2M – \$5M	\$2M - \$5M
Project management / Integration / Implementation	Assuming implementation over 4 years with 15-20 FTE \$3M - \$6M per year	\$12M - \$24M
Other HW and SW costs (SAN, other backend systems etc.)	\$2M - \$10M	\$2M - \$10M
Total Initial Costs		\$134M - \$200M

9.2.2 Operations and Management Costs

The operations and management costs are the yearly costs for operating the system.

Table 15: Operations & Management Costs

	Cost
Backhaul Communications Cost	\$0.5M - \$1M per year
NOC (SaaS) and Field Maintenance of the Network	\$2.5M - \$5M per year
Annual SW/HW Maintenance	\$1M - \$2M per year
Total Per Year Cost	\$4M - \$8M per year

9.2.3 Total Cost

Based on a 20 year analysis, the NPV of the costs are estimated to be \$204M - \$340M. The NPV cost over 20 years per meter is \$216 - \$363.



9.3 Operational Benefits

The following operational benefits of AMI are discussed:

- Reduction in meter reading costs due to meter reading automation
- Reduction in costs from other field and metering services such as off cycle reads and meter connects and disconnects
- Reduction in unaccounted energy due to consumption on inactive meters, energy theft etc.
- Improved outage management
- Improved distribution system management
- Call center and Customer care efficiencies and improvements
- Improved support for PEVs and DERs

We provide a quantitative discussion of the benefits from meter reading automation and other meter related services. A qualitative discussion of the other operational benefits is provided.

9.3.1 Meter Reading Automation

The total expenses for meter reading per year is approximately \$9.4 Million per year (this includes cost of reading electric meters, gas meters and overhead). The total reduction in meter reading costs by using AMI to read the electric meters is estimated to be \$6.5M per year. Currently the meters are also physically inspected during the meter reading process. By regulation, LG&E and KU are required to physically inspect the meters every 2 years. In case AMI is implemented, this will still require a technician to visit and physically inspect the meters every 2 years. The cost of the physical inspections is estimated to be about \$2M each year. Hence the net savings from AMI in reading and inspecting electric meters is estimated to be \$4.5M per year. The NPV with AMI of the reduction in meter reading and inspection costs over 20 years is estimated to be \$79M.

9.3.2 Field and Meter Services

AMI can be used to automate a number of currently manual field services such as off-cycle reads, meter re-reads, meter disconnects, reconnects etc.

LG&E and KU employ both company technicians and contractors to perform this work. KU has a total of 70 field technicians (42 company technicians and 28 contractor technicians). LG&E has 49 field technicians (19 company technicians and 30 contractor technicians).

The total yearly labor cost to LG&E and KU for field service technicians is \$10.8M. We estimate that LG&E and KU may be able to eliminate up to 33 percent of the field and meter services costs from AMI



automation (based on the assumption that manual intervention will be required for disconnections and reconnections). The NPV of this reduction in field and meter service costs may reach \$62M over 20 years. In addition to these savings, there are expected to be additional cost savings from reduced vehicle maintenance and fuel charges that are not quantitatively accounted in this report.

9.3.3 **Reduction in Unaccounted Energy**

AMI potentially leads to a reduction in energy theft, improved tamper detection and detection of dead meters. At present LG&E and KU does not have an estimate of losses due to unaccounted energy. Last year LG&E and KU investigated about 15,000 cases of meter tampering events. About 10,000 of these meter tampering cases were eventually confirmed.

9.3.4 **Improvement in Reliability**

AMI meters can generate outage messages. The messages can be directed to the OMS and can lead to reduction in outage detection time. In addition, AMI can help in detecting nested outages. The dispatch center can also ping the customer's meter to determine if the power is back on.

9.3.5 **Distribution System Management**

AMI can provide time based loading information and voltage information from the meters. This can be used for Volt/VAR control, transformer load monitoring as well as to optimize the investments in the distribution infrastructure.

LG&E and KU is currently planning an AMI project of about 1,700 meters in the downtown Louisville area mainly to use the loading data from AMI for distribution modeling of the network.

9.3.6 **Support for PHEVs, Demand Response, Distribution Automation and DERs**

AMI can support PHEVs through the use of TOU rates. In addition AMI can be used to deduce loading information on distribution transformers which may be used for preventing overloading of distribution transformers.

The 2-way AMI communication network also enables communications for distribution automation devices, DERs and demand response. Additional investments in addition to AMI would be required for enabling distribution automation, demand response etc.



9.3.7 Summary of AMI Costs and Benefits

The following table summarizes the costs and the quantified operational benefits of AMI.

Table 16: High-Level Costs & Benefits

Costs and Benefits	20 year NPV	Per customer
AMI Capital and O&M costs	(\$204M to \$340M)	\$216 - \$363 per customer
Meter Reading Automation benefits	\$79M	\$4.18 per customer per year
Field/Meter Services Automation benefits ²⁹	Up to \$62M	Up to \$3.28 per customer per year
Net Benefit	(\$199M) to (\$63M)	

As noted previously, there are a number of other operational benefits which have been discussed qualitatively but which have not been quantified in this report. A comparison with the costs and benefits of AMI at other utilities is discussed in Appendix D.

9.4 Summary of AMI Costs and Benefits

DNV KEMA participates as a member of the Smart Meter Consumer Collaborative, a group of utilities, Smart Meter equipment vendors, energy service providers, regulatory and non-profit consumer advocates all interested in advancing research related to the impact of the Smart Meter on customers. A recent study was completed by the SGCC entitled Smart Meter Economic and Environmental Benefits: A Review and Synthesis of Research on Smart Meter Benefits and Costs (October 8, 2013). The conclusion of this study is that (page 7):

- *The Smart Meter is likely to offer economic benefits in excess of cost*
 - *Increasing electric distribution efficiency, primarily through a capability known as Integrated Volt/VAR Control*
 - *Facilitating changes in customer behavior, either by shifting usage away from high-demand periods or by reducing usage altogether. These capabilities include Time-Varying Rates, Prepayment Programs, and Customer Energy Management*

²⁹ Savings related to automated disconnect/reconnect for non-payment were not included in the Field/Meter Services Automation benefits because the requirements related to these activities are not fully defined.



- *Reducing operating costs from capabilities such as remote meter reading and remote service disconnect/reconnect.*
- *Improving revenue capture through improved Smart Meter accuracy and theft detection capabilities.*
- *The Smart Meter offers significant reduction in environmental impact.*
 - *Carbon Dioxide-equivalent reductions can be traced directly to Smart Meter capabilities offering a conservation effect.*
 - *To the extent customer-sited generation is predominantly renewable, Smart Meter capabilities designed to accommodate it offer even more significant environmental benefits.³⁰*

³⁰ SGCC, Page 7.



10. Recommendations

This study indicates that full deployment of AMI at this time may not provide adequate returns or be economic for the Companies and their customers. Targeted deployments may provide benefits while limiting costs. AMI deployment can also serve as a foundation for energy efficiency, Direct Load Control and distribution improvements going forward. Based on the data available for this study, preliminary indications are that urban/suburban communities may best suited to targeted AMI conversion as they are likely to present a strong combination of operational and customer benefits.

10.1 Customer Segmentation

When planning for targeted deployments, a number of key considerations must be taken into account including the thorough testing of a discrete set of potential customer engagement strategies with additional quantitative and qualitative market research; additional surveys would improve the Companies' ability to quantify the likely levels of engagement and resulting impacts on revenues, energy savings and peak load reduction, to facilitate a more comprehensive cost-benefit analysis that includes customer components. Most importantly, such research would help identify the appropriate messages that would appeal to the high potential segments of the population.

This recommendation is consistent with this lesson learned from the US DOE SGIG study:

“Many of the utilities found that focus groups, surveys, and other research on customer preferences were vital components for test marketing terms and concepts for convincing customers to participate in solicitation efforts. This was because the opinions of the utilities about what would be effective marketing terms frequently differed from what customers thought would be effective.” (SGCC, page v).

Also, from a summary of five case studies, a meta-evaluation conducted by DEFG indicated that:

“Utilities are investing very modestly in customer education, especially when viewed in the context of overall smart grid deployment costs. Yet the critical barrier to implementation and acceptance often appear in the courts of public opinion, which would be helped by greater media and customer understanding.”³¹

³¹ Wimberly, Jamie, DEFG EcoAlign; DETech, Meta Analysis and Utility Case Studies on Smart Grid Communications; Smart Grid Communications Top Line Findings; (June 2012)



We further recommend that these market research results would allow for a customer segmentation analysis to develop more definitive estimate of the potential for customer engagement for the specific offerings selected. This research would be useful in the development of an outreach and marketing plan for proceeding with geographically targeted deployment, and a refined assessment of likely customer costs and benefits. A combination of surveys and focus groups are the likely methods that would be appropriate.

10.2 Geographic Targeting

The Companies' low cost and high reliability limit any deployments that are economic and do not justify system wide deployment at this time. From our high level review of LG&E and KU, however, it is most likely that LG&E and KU may be able to justify deployments in these areas first as the benefits are highest and the cost to deploy lowest. This study has pointed to several locations that would appear to be good candidates for Smart Meter deployment from a customer acceptance standpoint. A full geographic analysis would combine the customer acceptance results with a review of the physical features of the system where operational benefits might be highest, and conversion costs low. A combined assessment of all of these variables together would render a prioritized list of locations for consideration for staged Smart Meter deployment by the companies.

DNV KEMA Energy & Sustainability



APPENDICES



Appendix A: Customer Demographics and Attitudes

The various data sources used for the residential sector analysis have different levels of granularity. For data from LG&E and KU we present data at the LG&E, KU and combined LG&E and KU levels. Data from LG&E and KU's Residential Appliance Saturation Survey includes a special section "RPP (Pilot)", which provides responses for those who participated in the Responsive Pricing Pilot.

For ACS, we have data down to the Kentucky level, while the RECS data only goes down to a regional level that includes Kentucky, Alabama and Mississippi.

High Usage Indicators

Direct monetary gains tend to be the most cited benefit in both LG&E and KU and industry studies. Fifty-one percent of respondents in the Residential Smart Meter Survey's study said they would want to see at least \$25 in savings per month to be interested in implementing Smart Meter technology.³² Actual savings were under \$2 over a 4 month summer period under the RPP, indicating that the expectation as expressed in the survey would be unlikely to be realized.

The DOE's 2009 RECS data shows that single-family households use more energy on average than multi-family and mobile home households. When comparing LG&E and KU house-types to regional and national levels, LG&E and KU reported higher percentages of people living in single family homes, about 78 percent, compared with the national level of 66 percent or even the Kentucky state-level estimates of 69 percent. Five percent of respondents to LG&E and KU's Appliance Saturation Survey reported they lived in a mobile home, compared with 13 percent of Kentucky households living in a mobile home as reported in the 2011 American Community Survey.

In the United States, space heating, space cooling and water heating account for over half the household annual energy consumption.³³ However, these end uses do not always come from the same energy source.

³² Question from Residential Smart Meters Study: "How much would you need to save on your monthly electric bill in order to change your behavior, such as adjusting your thermostat to sometimes less comfortable settings, changing the time of day you use appliances, etc.?"

³³ 2009 Residential Energy Consumption Survey, US DOE, Energy Information Administration



LG&E and KU customers differ significantly in terms of energy source for space heating and water heating. The majority of LG&E customers use natural gas as their main heating fuel (74 percent), while the majority of KU customers use electricity as their main heating fuel (56 percent).

Table 17: Penetration of Electric Heating and Cooling

	Pilot (RPP)	KU	LG&E	LG&E and KU	National
	35	500	503	1038	
Electric heating, water heating & central AC	11.4 percent	30.8 percent	13.5 percent	21.8 percent	22.8 percent
Electric heat, electric water, no central AC	5.7 percent	18.2 percent	4.6 percent	11.2 percent	9.4 percent
Electric heat, central AC, no electric water	5.7 percent	2.6 percent	4.8 percent	3.8 percent	11.1 percent
Electric water, central AC, no electric heat	2.9 percent	13.6 percent	9.7 percent	11.4 percent	4.8 percent
Central AC only	71.4 percent	24.4 percent	62.0 percent	44.2 percent	22.6 percent
Electric Water heating only	0.0 percent	5.8 percent	0.4 percent	3.0 percent	4.5 percent
Electric heating only	2.9 percent	1.0 percent	0.6 percent	0.9 percent	7.7 percent
None	0.0 percent	3.6 percent	4.4 percent	3.9 percent	17.1 percent

Source: 2010 RASS, 2009 RECS

Table 17 shows about 31 percent of KU customers have electric space heating, electric water heating, and central air conditioning. The next highest proportion of customers has central air conditioning only. The majority of LG&E customers, around 62 percent, have only central air conditioning.

LG&E and KU's Direct Load Control (DLC) program allows the utility to shut off a household's central air conditioning, electric water, and/or pool pump remotely at times of system peak to help alleviate demand on the system.

Table 18 shows the percentage of households that have the listed devices. Most households had only one of the three, with KU customers being more likely to have two of the three items; this is largely due to the higher penetration of electric water heating in the KU service territory. While KU customers are more likely to have two items that can be controlled, a lower proportion of KU customers are enrolled in the DLC and/or other Demand Response Programs; fifteen percent of KU customers are enrolled in DLC or a



demand response program, compared with 23 percent of LG&E customers. See Figure 15 below for a geographical display of DLC participation to date.

Table 18: Direct Load Control

	Pilot (RPP)	KU	LG&E	LG&E and KU
	35	500	503	1038
None	2.9 percent	4.4 percent	5.0 percent	4.6 percent
One of three	82.9 percent	48.4 percent	66.6 percent	58.4 percent
Two of three	11.4 percent	45.2 percent	26.2 percent	34.9 percent
All three	2.9 percent	2.0 percent	2.2 percent	2.1 percent

Source: 2009 Residential Energy Consumption Survey, DOE, Energy Information Administration

Between the two companies, LG&E customers have both a greater saturation of central AC systems (62 percent versus 24 percent for KU) and at least one of the three primary controllable appliances (66 percent), whereas KU customers are more likely to have two of the three controllable appliances than LG&E customers (45 percent versus 26 percent).

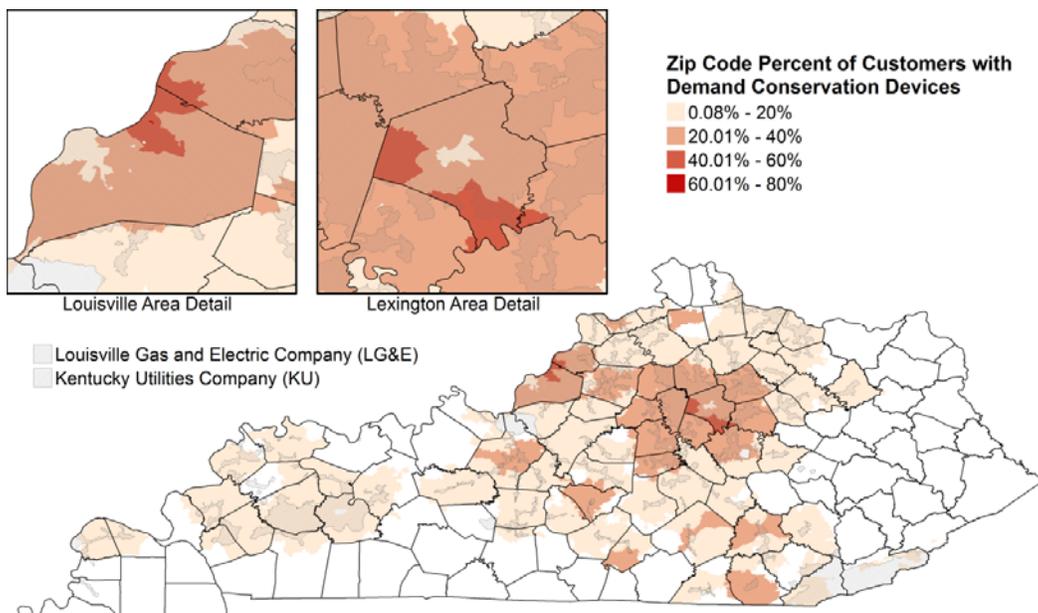


Figure 15: Direct Load Control Participation by Zip Code



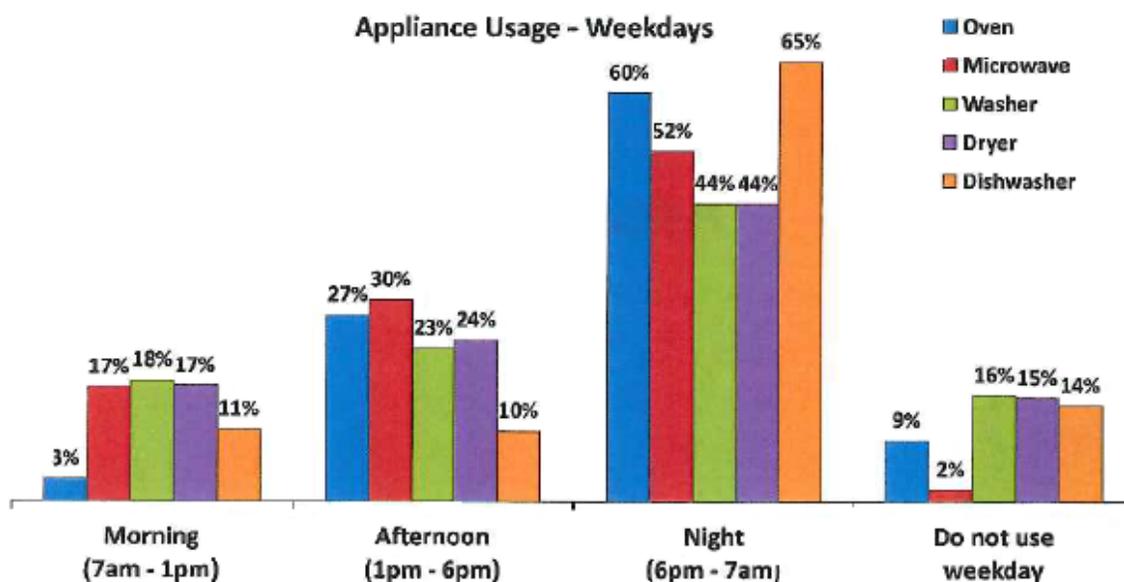
Other appliances with high energy usage include refrigerators, standalone freezers, clothes dryers, and dishwashers. Most homes have at least one refrigerator, but it is less common for homes to have a separate freezer, dishwasher and/or clothes dryer. However, these units can all be high energy users. Table 19 shows the frequency of households with one or more of these appliances. There is generally little difference between the saturation of most of these appliances in LG&E versus KU service territories.

Table 19: Energy Intensive Appliances

	Pilot (RPP)	KU	LG&E	LG&E and KU	National
All three	17.1 percent	27.2 percent	23.5 percent	25.1 percent	20.6 percent
Electric dryer and dishwasher	68.6 percent	35.0 percent	37.5 percent	37.3 percent	33.9 percent
Electric dryer and freezer	0.0 percent	11.9 percent	5.6 percent	8.5 percent	8.2 percent
Freezer and dishwasher	2.9 percent	1.1 percent	5.0 percent	3.1 percent	0.3 percent
Electric dryer only	0.0 percent	14.7 percent	9.7 percent	11.8 percent	16.7 percent
Dishwasher only	5.7 percent	4.0 percent	8.2 percent	6.1 percent	4.6 percent
Freezer only	0.0 percent	2.5 percent	2.9 percent	2.6 percent	1.3 percent
None	2.9 percent	2.9 percent	4.5 percent	3.6 percent	14.4 percent

Source: 2009 RECS, 2010 RASS

According to the survey conducted by Residential Smart Meter Survey, the majority of households most often use their appliances during the 6pm to 7am window, with the next highest usage section being during the 1pm to 6pm window. Peak usage generally occurs during the 1-6pm event window, but some may continue past 6pm. Therefore, future survey research might break these usage windows into smaller periods, especially in the evening since 6pm-9pm usage affects a utility's energy planning more than 9pm to 7am.



Source: Figure from Bellomy, Residential Smart Meter Survey; 2012 Presentation on Results

Figure 16: Appliance Usage

High penetration rates for energy-intensive appliances, combined with KU's high electric space and water heating penetration, show a slightly heavier reliance on electricity in the KU region.

Customer Relationship with Energy Usage

A potential barrier to a successful Smart Meter program is whether a customer cares enough about reducing energy or shifting usage based on TOU rates or other incentives to alter their behavior. This is especially true in regions with lower electricity rates. This section examines indicators of customer investment in modifying the cost of their energy bill.

Having electricity bills included in the rent reduces a household's investment in energy usage and makes it difficult for those who do want to alter their consumption patterns to know how they are doing. About five percent of US households have a portion of their entire electricity bill included in their rent. Only 1 percent of households in the Kentucky, Alabama and Mississippi region have electricity costs included in their rent. Table 20 shows that there is a lower percentage of households that rent in Kentucky compared to the national average. While renters often pay their own energy bills, renters still present a challenge for utility programs as they often need permission from landlords before enrolling in programs or purchasing new equipment.

**Table 20: Home Ownership**

	Kentucky	Regional	National
Own Home	68.9 percent	68.7 percent	64.6 percent
Rent Home	31.1 percent	31.3 percent	35.4 percent

Source: 2011 American Community Survey, Selected Housing Characteristics

Despite having lower rates of electricity than most other states, the average annual electricity bill in the Kentucky, Alabama and Mississippi region is higher than the national average due to higher usage levels. The average household in the Kentucky, Alabama and Mississippi region use almost 4,000 kWh more per year than the US average household. Even so, LG&E and KU customers have lower average annual electric bills than the average bills in either the region, the neighboring states or nationally as shown below in Table 21.

Table 21: Electric Usage and Bill - Distribution

	LGE & KU		Kentucky, Alabama, Mississippi		National	
	USD	kWh	USD	kWh	USD	kWh
Average	\$1,257	15,488	\$1,586	15,236	\$1,340	11,320
Minimum	n/a	n/a	\$57	685	\$0	17
25 percent		n/a	\$966	9,745	\$733	5,812
50 percent (Median)		n/a	\$1,461	14,656	\$1,151	9,687
75 percent		n/a	\$2,136	19,187	\$1,719	14,895
Maximum		n/a	\$5,214	48,926	\$19,040	150,254

Source: Column 1 – LG&E and KU customer data; other Columns - 2009 Residential Energy Consumption Survey

Table 22 below shows the detail of average bills and consumption by separate Companies.

Table 22: Average Customer Bills and Usage

	Average of bills	Average of kWhs
KU	\$ 1,277	15,776
LG&E	\$ 1,154	13,895
LG&E and KU combined average	\$ 1,257	15,488

Source: LG&E and KU customer data, un-weighted by # of customers in each zip



Customer demographics related to Smart Meter engagement

Local research done after the pilot in 2011 indicates that the households most interested in Smart Meters tend to have higher levels of education, higher income, and are more technologically driven than the average household.³⁴ The Residential Smart Meter Survey found that customers who agree with the statement “Technology makes my life easier” had a higher likelihood of participating in a Smart Meter program.³⁵ This survey also suggested that among the respondent pool, younger people tend to be more interested in Smart Meter programs; however it must be noted that since the survey was limited to customers with known email accounts and who were able to complete the survey on-line, the results are most likely skewed to a younger respondent pool than the general customer population. Other research has indicated higher levels of interest in Smart Meter programs among the older population.³⁶

The Kentucky, Alabama and Mississippi Region tend to have an older population compared with the National statistics. The percentage of people with at least a high school degree is on par with the regional and national stage, though Kentucky and the South Central Region do have a somewhat lower percentage of those with a Bachelor’s Degree or higher (21 percent in Kentucky) compared with the National average of 29 percent.

Table 23: Head of Household - Age

	Kentucky, Alabama, Mississippi	National
16 to 44	29.5 percent	39.4 percent
45 to 64	43.6 percent	39.4 percent
65 and older	26.9 percent	21.2 percent

Source: 2009 Residential Energy Consumption Survey

³⁴ LG&E 2009 Smart Rate Program Assessment, Executive Summary Report; Bellomy Research, Residential Smart Meter Survey

³⁵ Other statements that correlated with higher likelihood of participating in a Smart Meter program across different segments of the LG&E and KU populations included “Reducing Carbon Footprint”, “Low carbon energy is future”, “Consider myself green”, “Look for Energy Star Ratings”.

³⁶ LG&E 2009 Smart Rate Program Assessment, Executive Summary Report

**Table 24: Head of Household - Education**

	Kentucky	Regional	National
Percent high school graduate or higher	83.1 percent	83.1 percent	85.9 percent
Percent Bachelor's degree or higher	21.1 percent	22.1 percent	28.5 percent

Source: 2011 American Community Survey, Selected Social Characteristics in the United States

Demographics that negatively affect Smart Meter engagement

Even if households have a desire to reduce energy and participate in a responsive pricing program, several factors negatively affect some households' ability to participate. Usually, this stems from the household not being able to shift energy use to other periods due to someone being home during the day (retirees, unemployed, young children) or people being sensitive to temperature changes (elderly and children), or those who require electricity for a medical reason.

Being home during the day both reduces desire to set back the thermostat and increases likelihood of appliance use during peak periods. Table 25 shows the percentage of households in the United States that have at least one child under 18, at least one person aged 60 or over, and single-resident households, where the person is 65 or over. The ten percent of households that have an elderly person living alone represent both people who are likely to be home during the day and those who are likely to be sensitive to temperature changes.

Table 25: Households and Families

	Kentucky	Regional (AL, KY, MS)	National
Children (under 18)	31.8 percent	32.0 percent	32.4 percent
Elderly (60 and over)	35.4 percent	36.1 percent	35.6 percent
Elderly (65+) living alone	10.2 percent	10.1 percent	9.9 percent

Source: 2012 American Community Survey, Households and Families

Kentucky, Alabama and Mississippi have a higher percentage of people who are unemployed and/or retired than other regions of the US. This could indicate more people are home during peak energy usage hours, potentially leading to increased difficulty in getting people to change their habits.

**Table 26: Unemployment**

	Regional (AL, KY, MS)	National
Not employed/retired	50.6 percent	39.5 percent
Works Part-time	6.8 percent	10.8 percent
Works Full-time	42.6 percent	49.7 percent

Source: 2009 Residential Energy Consumption Survey

Ability to get updates and change behavior quickly is another factor in responsiveness, especially for Smart Meter pricing that includes critical peak times. Having access to a cell phone, especially a smart phone which may be connected to a thermostat or even some smart appliances, could impact the ability for households to comply with critical peak reductions. Ninety-six percent of respondents to the Residential Smart Meter Survey owned a smart phone, with penetration at 99 percent for those 18-44 and 90 percent for those over 65. The differences in age are more apparent when it comes to smart phone ownership, with 80 percent of respondents ages 18-44 having a smart phone compared with 55 percent for those ages 45-64 and 36 percent for those 65 and older.

Current Knowledge and Opinions on Smart Meter

Research on the Smart Meter Pilot and the Residential Smart Meter Survey provide information on current knowledge and opinions about Smart Meter. While higher response rates from younger, more educated and technologically able populations may overstate the desire for Smart Meter, the information can still provide insight into what some of the main benefits and problems are with this new technology. Of those that responded to the Residential Smart Meter Survey:

- Twenty-seven percent reported being aware of Smart Meters. This varied both by age and income with younger and lower-income households being less likely to be aware of Smart Meters.
- When those who were aware of Smart Meters were asked about the advantages and disadvantages of Smart Meters, many people could not provide a response. Forty-six percent said they did not know of any advantages and fifty-nine percent said they did not know of any disadvantages.
- Advantages listed by at least five percent of the respondents included: ability to track electricity usage, conserve energy, save money, rate plans based on electricity usage. About eight percent said there were no benefits of Smart Meters.



- Disadvantages included loss of control, inaccurate/possibility of malfunction, uncomfortable temperature and lack of privacy. About 5 percent said there were no disadvantages of Smart Meters.

After being asked what they knew about Smart Meters, respondents received a definition of what a Smart Meter was and a description of what a Smart Meter program entailed. After hearing this description, 59 percent of respondents reported they would be likely to participate in a Smart Meter program, with 24 percent saying they would be unlikely to participate and 16 percent being neutral.

The survey then delved into specific types of Smart Meter programs: time of use, critical peak pricing, peak time rebate, and inclining block. The Residential Smart Meter Survey developed a ‘take rate’, which combined the ratings for the likelihood of participating, the ease of understanding, the ease of making usage changes and the motivation to lower usage/save money for each rate option (see Table 27).

Their analysis concluded that among the respondents, the peak time rebate was most favorable, followed by the time of use rate plan. However, other studies conducted on the effect of participation in Smart Meter programs found there was no statistically significant difference between the uptake on different pricing programs.³⁷

Table 27: Residential Smart Meter Survey ‘Take Rates’

	Time of Use (A)	Critical Peak (B)	Peak Time Rebate (C)	Inclining Block (D)
Likelihood to Participate (T2B)	55.2% ^{BD}	48.6% ^D	70.4% ^{ABD}	37.9%
Ease of Understanding (T2B)	76.4% ^{BD}	72.0% ^D	74.2% ^D	60.5%
Ease of Making Usage Changes (T2B)	52.8% ^{BD}	48.2% ^D	64.1% ^{ABD}	36.5%
Motivation to Lower Usage/Save Money (T2B)	59.1% ^{BD}	54.0% ^D	72.4% ^{ABD}	43.4%
Take Rate*	42.9% ^{BD}	37.7% ^D	55.0% ^{ABD}	25.4%

Source: Bellomy Research, Residential Smart Meters Study (2012)

³⁷ Annika Todd, Peter Cappers, Charles Goldman. “Residential Customer Enrollment in Time-based Rate and Enabling Technology Programs”. Smart Meter Investment Grant: Consumer Behavior Study Analysis. <http://emp.lbl.gov/research-areas/demand-response-smart-grid>



It must be noted that self-reported intentions to participate in programs does not equal actual action on the part of customers, thus these figures represent a top of range estimate of the potential population for program offerings.

Current Participation in Energy Efficiency and Energy Conservation Programs

LG&E and KU already have many energy efficiency and Energy Conservation Programs. This information provides evidence of the propensity of LG&E and KU customers to take advantage of services related to energy use and costs similar to what might be offered as part of a Smart Meter strategy. Table 28 shows the enrollment percentages across LG&E and KU for all programs. It also includes whether the program was opt-in (where customers voluntarily chose to participate) or opt-out (where customers are automatically enrolled but can elect to drop out if they wish). A recent study published by Lawrence Berkeley National Labs shows more customers enroll in a time-based rate program when the program is opt-out rather than opt-in.³⁸

LG&E and KU did not have a similar opt-in versus opt-out approach during the Smart Meter pilot. However, one can examine the difference in rates LG&E and KU's energy programs to see in general how LG&E and KU customers respond to opt-in versus opt-out programs. The Smart Energy Profile, which was initially launched with an enrollment of 332,998 residential customers has only had 1,174 people opt-out to date (<0.5 percent). In comparison, the program with the next highest enrollment is the Demand Conservation Devices, which has 23 percent enrollment. As the Smart Energy Profile, run by OPower, only provides a report on the household's energy use and ways the household could reduce energy, it is not comparable to a Smart Meter program which incorporates changes in billing that could negatively affect households that do not change behavior.

³⁸ Annika Todd, Peter Cappers, Charles Goldman. "Residential Customer Enrollment in Time-based Rate and Enabling Technology Programs". Smart Meter Investment Grant: Consumer Behavior Study Analysis. <http://emp.lbl.gov/research-areas/demand-response-smart-grid>

**Table 28: Enrollment in LG&E and KU Energy Programs**

	No . of LG&E and KU customers participating as of 9/11/2013	percent of All residential customers	Opt-in/Opt-out
Smart Energy Profile	331,824	99 percent of original enrollees (42 percent of all residential) ³⁹	Opt-out
Demand Conservation Devices (Direct Load Control or DLC)	181,689	23 percent	Opt-in
Home Energy Rebates	37,450	5 percent	Opt-in
On-Site Home Energy Analysis	15,294	2 percent	Opt-in
Online Home Energy Analysis	13,382	2 percent	Opt-in
We Care	13,101	2 percent	Opt-in
Fridge & Freezer Recycling	9,709	1 percent	Opt-in
Energy Saving New Homes	4,161	1 percent	Opt-in
On-Site Home Energy Analysis Incentive (Tiers 2 & 3)	178	<1 percent	Opt-in

³⁹ The Smart Energy Profile targets the highest consuming residential customers.



Appendix B: Model Descriptions: Propensity to Participate

This section describes the modeling that was conducted as the basis for the propensity to participate findings.

Model – LG&E and KU data alone

Customers who have demand conservation devices for direct load control are participants who have opted-in to the program. The objective of this analysis is to model the propensity to participate in an opt-in program as a function of other customer information available to us at the zip code level. We compute the percent opted in to a direct load control program (DLCPCT) as the ratio of the total number of households with demand conservation devices to the total number of customers in that zip code. Figure 17 below shows the distribution of the dependent variable, DLCPCT.

While we use this ratio as the best available approximation of participation for our model, we acknowledge that the degree of participation at the 5 digit zip level could be over stated/under stated due the following reasons and may be refined by using the more precise number of eligible households in the denominator:

1. LG&E and KU does not serve every customer in every zip code
2. Not all LG&E and KU customers are eligible for DLC (among other criteria, participation in a DLC program requires households that have central air conditioners)

Figure 14 below displays the distribution of the dependent variable, DLCPCT, and reveals that over 70 percent of the 5 digit zips in LG&E and KU territory have less than 20 percent participation in DLC programs.

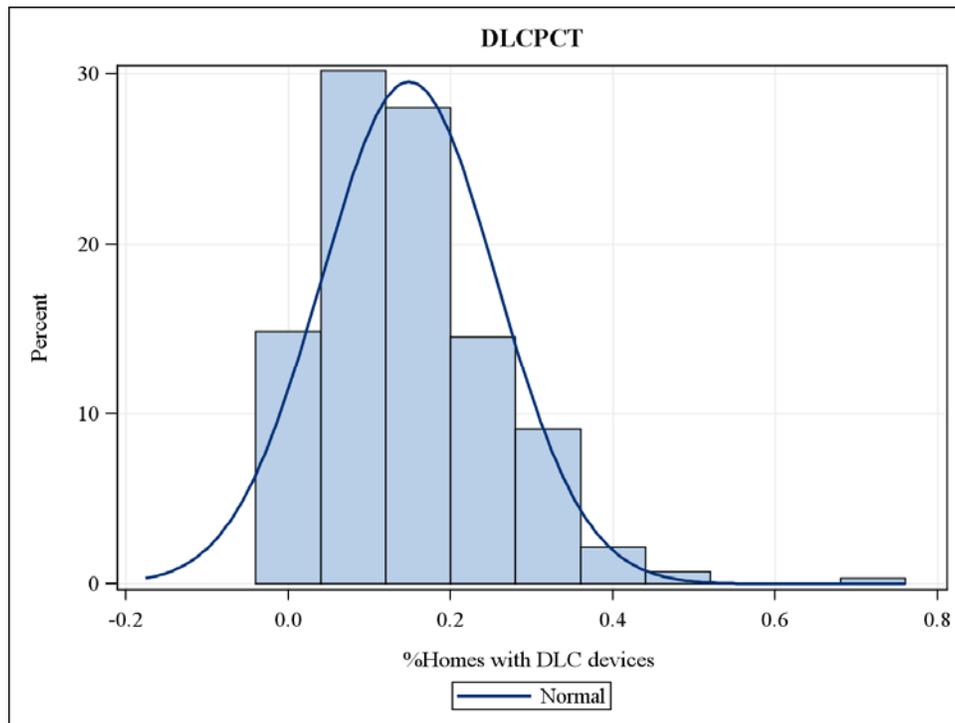


Figure 17: Percent of homes with DLC devices at the 5 digit zip level

Due to missing data on some variables, we are able to use data for 281 zip codes out of 361 records in total. The first step prior to model building is to examine the correlations of all potential explanatory variables with the dependent variable.



Table 29: Correlation of explanatory variables with DLCPCT
(percent of homes with demand conservation devices/direct load control)

Data Source	Label	Correlation with DLCPCT
ACS	percent Bachelor's degree	0.7
ACS	Median home value - owner occupied	0.7
ACS	percent Masters or higher	0.7
ACS	Median family income	0.6
LG&E	percent with email	0.5
ACS	Median non-family income	0.5
LG&E	percent Confirmed owner	0.5
ACS	Median number of rooms	0.4
ACS	percent Some college	0.3
ACS	percent Employed	0.2
ACS	Median number of bedrooms	0.1
ACS	percent Household size =1	0.1
LG&E	Average electricity consumption	0.1
ACS	percent Household size =2	0.1
ACS	Year home built	-0.1
ACS	percent Household size >=4	-0.1
ACS	percent Household size =3	-0.1
ACS	percent Owner occupied homes	-0.1
LG&E	percent Bill Pledge	-0.3
ACS	percent Not in labor force	-0.5
ACS	percent High school or equivalent	-0.7

A basic model with LG&E and KU data alone and explanatory variables on home ownership, percent of customers with email (contact info per LG&E and KU), average electricity usage, percent bill pledge yields a model with an Adjusted R squared fit statistic of 0.30. While all the above explanatory variables are significant predictors of propensity to participate in an opt-in program (DLCPCT), the fit statistic of 0.30 indicates that the behavior of the dependent variable is not captured to a significant extent with just the above set of variables.



Model – LG&E and KU and ACS data combined

DNV KEMA compiled publicly available demographic data from the ACS at the 5 digit zip code level for the list of zip codes as in the customer data file obtained from LG&E and KU. Variables selected for inclusion in our ACS data are: household size as a prevalence percentage by various sizes, employment status, level of education as a prevalence percentage by various levels of attainment, number of rooms in the household, age of residential structure, number of bedrooms, and value of the home. We note here that the summary statistic available in the ACS data on family income, value of home, and age of structure is the median.

Our next model uses the same dependent (DLCPCT), but information from the ACS data used as the explanatory variables. Another version of this model merges the LG&E and KU provided customer information to ACS data to create an enriched record of explanatory variables. These two models (ACS data alone and ACS combined with LG&E and KU) are significant with an Adjusted R squared fit statistic of 0.60 and 0.62 respectively. This is an improvement compared to the model in Step 1 which relied solely on customer data available to LG&E and KU. While this is still not capturing all of the variation/behavior in the dependent variable, we are capturing a significant portion of it. The small difference in fit statistics (0.60 vs 0.62) from using ACS data alone in the 1st model to using both LG&E and KU and ACS data in the 2nd model could be due to the fact that some of the explanatory variables might be correlated and hence due to collinearity, the incremental lift going from a model based solely on ACS data to one based on both ACS and LG&E and KU data is small.

While we already have the actual percent enrolled in a DLC opt-in program, the objective of building a model based on zip level data is to understand the key drivers of this variable in terms of demographics and other energy usage characteristics. This model shows that we are able to do this with a fit of 0.6, indicating again that while we have captured the majority of the variation, it may be improved with the addition of additional variables on customer behavior, attitudes, and needs. In this form, DNV KEMA can share with LG&E and KU the model parameters (akin to a scoring function) to be applied to individual or some aggregated level of customers to assess their propensity to adopt. Given the data at hand, the fit of the model is at 0.6.

Some further refinements to the model building procedure such as excluding outliers (we have used all the data points in this model) and dropping variables that are collinear with other explanatory variables could contribute to an improved fit.

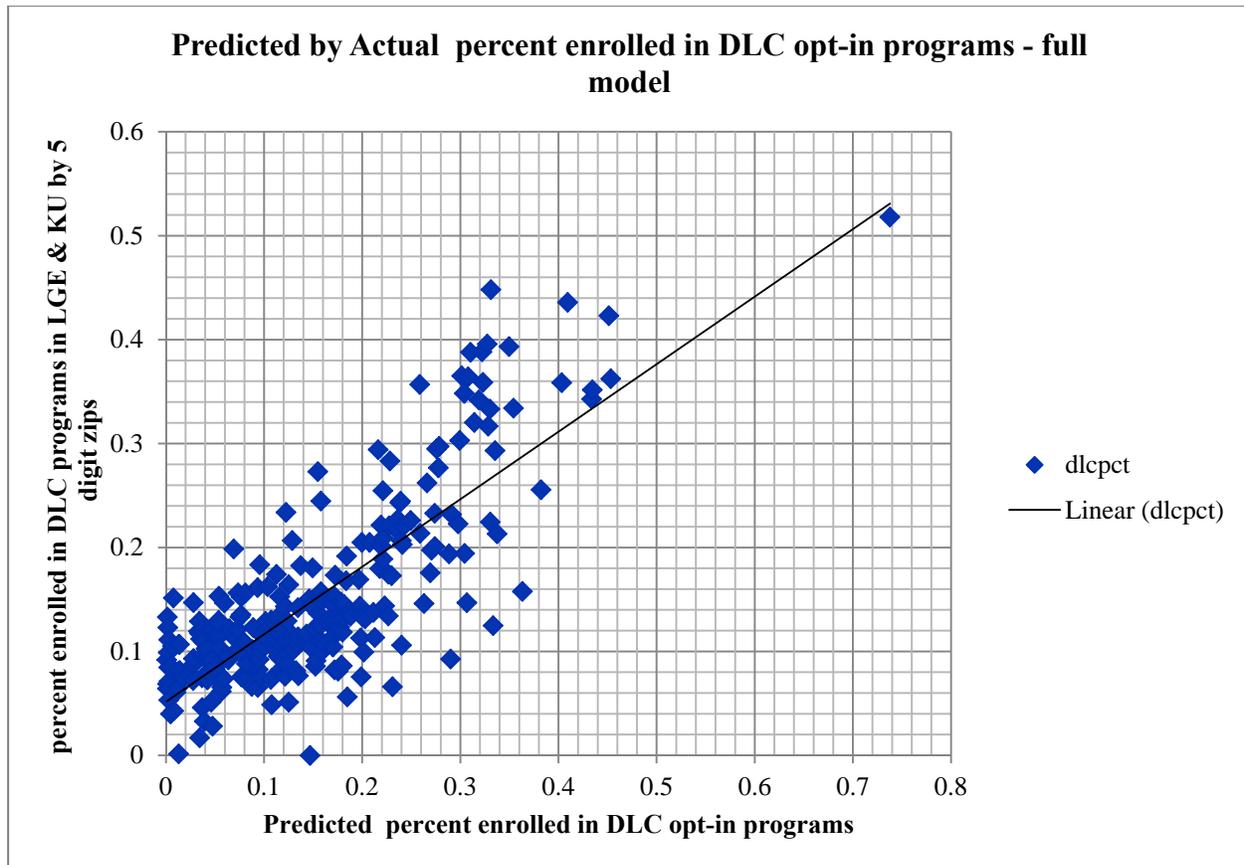


Figure 18: Plot of Predicted by Actual percent enrolled in DLC opt-in programs (model based on LG&E and KU and ACS data) – Adj Rsq=.62

Fit is increased further to an Adj R-sq of 0.85 with a minimum model that excludes collinear variables and retains only the three predictors listed below:

- Education - percent Bachelor's degree
- Median number of bedrooms
- Median home value of owner occupied housing units

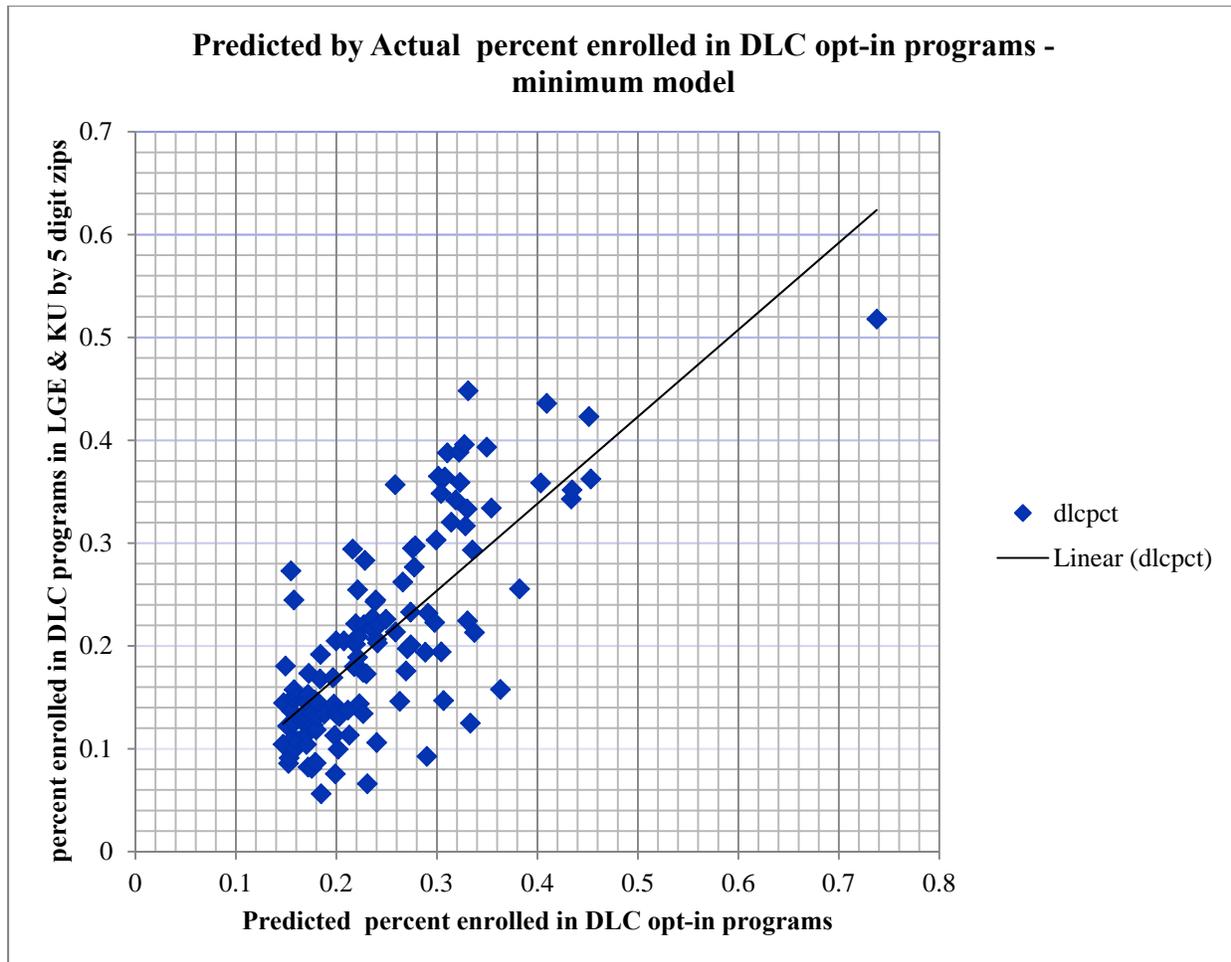


Figure 19: Plot of Predicted by Actual percent enrolled in DLC opt-in programs (model based on LG&E and KU and ACS data) – Adj Rsq=.85

Potential Participation (Stay Enrolled) in Opt Out Programs

LG&E and KU has provided DNV KEMA with aggregated customer information at the 5 digit zip code level across 361 zip codes in its service territory on the total number of customers, total number of customers participating in a direct load control program who have demand conservation devices in their home, the total number of customers who stay enrolled in an opt-out comparative home energy report program (Smart Energy Profile), customers with email access, energy consumption in KWH, percent enrolled in bill pledge, and customers who are confirmed/likely owners versus renters.

Model – LG&E and KU data alone

The objective of this analysis is to model the propensity to participate in an opt-out program as a function of other customer information available to us at the zip code level. We compute the percent who stay enrolled in an opt out program (OPTOUTSTILLIN) as the ratio of the total number of households currently enrolled/subscribed to Smart Energy Profile to the total number of customers in that zip code. Figure 3 below shows the distribution of the dependent variable, OPTOUTSTILLIN.

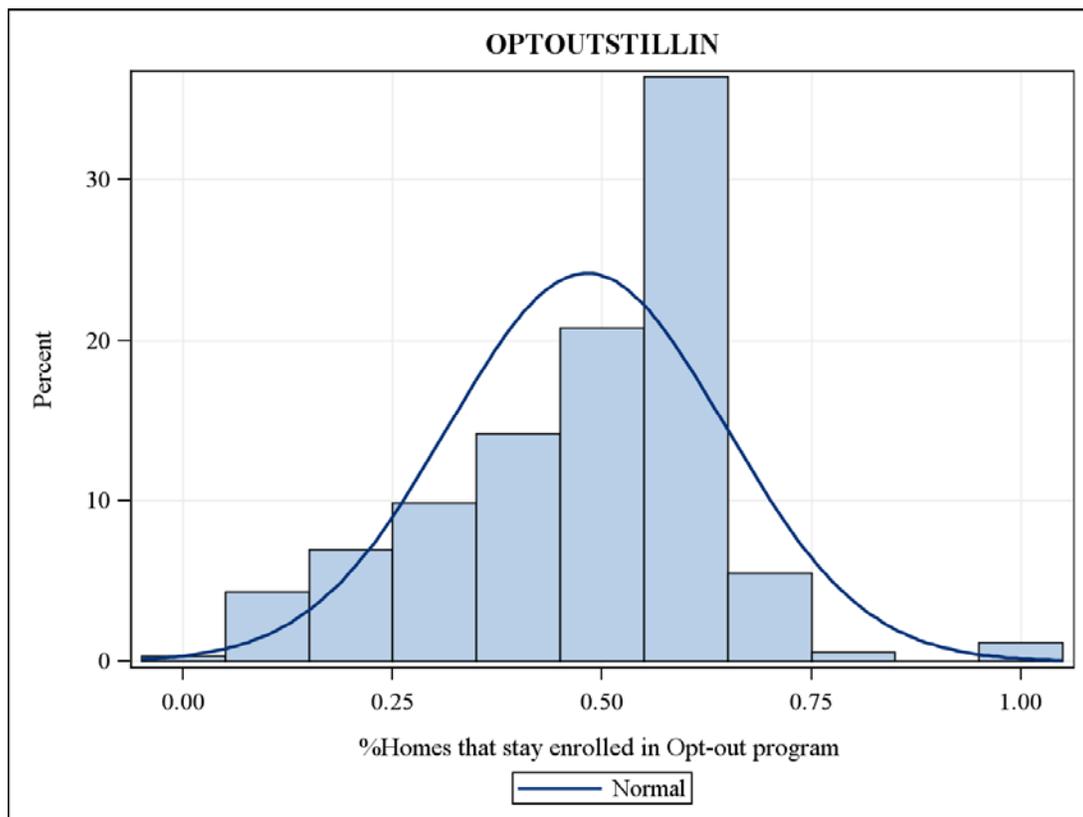


Figure 20: Distribution of percentage of homes that stay enrolled in an Opt-out Program

The table below displays correlations of all potential explanatory variables with the dependent variable OPTOUTSTILLIN (the percentage of homes, at the 5 digit zip code level, that are still enrolled in an opt-out program). While the explanatory variables had high correlations ranging from 0.7 to -0.7 in the case of DLCPCT (the percentage of homes with direct load control devices), we see that the relationship is much weaker in the case of OPTOUTSTILLIN (the percentage of homes that stay enrolled in an opt-out program) with correlations that range from 0.3 to -0.2.



**Table 30: Correlation of explanatory variables with OPTOUTSTILLIN
(percentage of homes still enrolled in an opt-out program)**

Data Source	Label	Correlation with percent still enrolled in an opt-out program
ACS	percent Owner occupied homes	0.3
LG&E	Average electricity consumption	0.2
ACS	Median number of bedrooms	0.2
ACS	percent Employed	0.2
ACS	Year home built	0.2
ACS	Median number of rooms	0.1
ACS	percent Household size =2	0.1
ACS	percent High school or equivalent	0.1
ACS	percent Household size =3	0.1
ACS	Median family income	0.0
ACS	percent Some college	0.0
ACS	Median non-family income	0.0
ACS	percent Not in labor force	0.0
ACS	percent Household size >=4	0.0
LG&E	percent Confirmed owner	0.0
LG&E	percent Bill Pledge	-0.1
ACS	percent Masters or higher	-0.1
ACS	Median home value - owner occupied	-0.1
ACS	percent Bachelor's degree	-0.1
ACS	percent Household size =1	-0.2
LG&E	percent with email	-0.2

A basic model with LG&E and KU data alone and explanatory variables on home ownership, percent of customers with email (contact info per LG&E and KU), average electricity usage, percent bill pledge yields a model with an Adjusted R square fit statistic of 0.19. While all the above explanatory variables are significant predictors of propensity to participate in an opt-in program (DLCPCT), the fit statistic of 0.19 indicates that the behavior of the dependent variable is not captured to a significant extent with just the above set of variables.

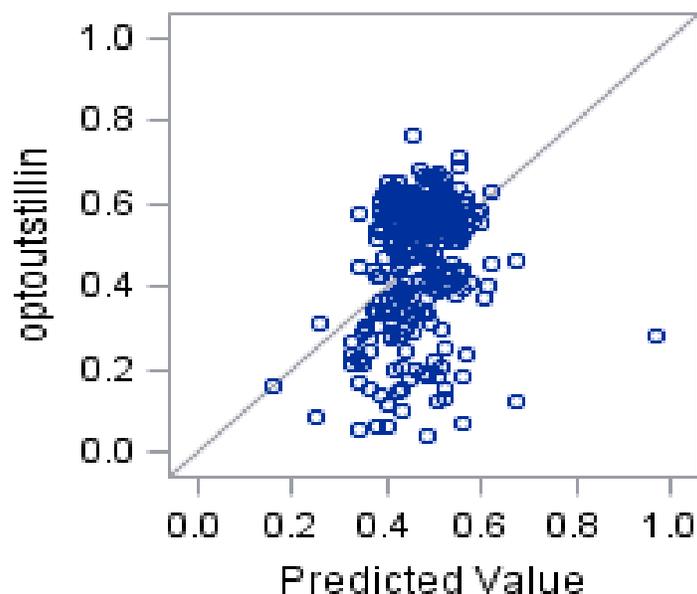


Figure 21: Plot of Actual versus Predicted (LG&E and KU data only) percent of homes still enrolled in opt-out programs, Adj R-sq=.19

Model – LG&E and KU and ACS data combined

Our next model uses the same dependent (OPTOUTSTILLIN), but information from the ACS data used as the explanatory variables. Another version of this model merges the LG&E and KU provided customer information to ACS data to create an enriched record of explanatory variables. These two models (ACS data alone and ACS combined with LG&E and KU) are significant with an Adjusted R square fit statistic of 0.17 and 0.21 respectively. While the combined model is a marginal improvement compared to the model in Step 1 which relied solely on customer data available to LG&E and KU, the model still does not capture all of the variation/behavior in the dependent variable.

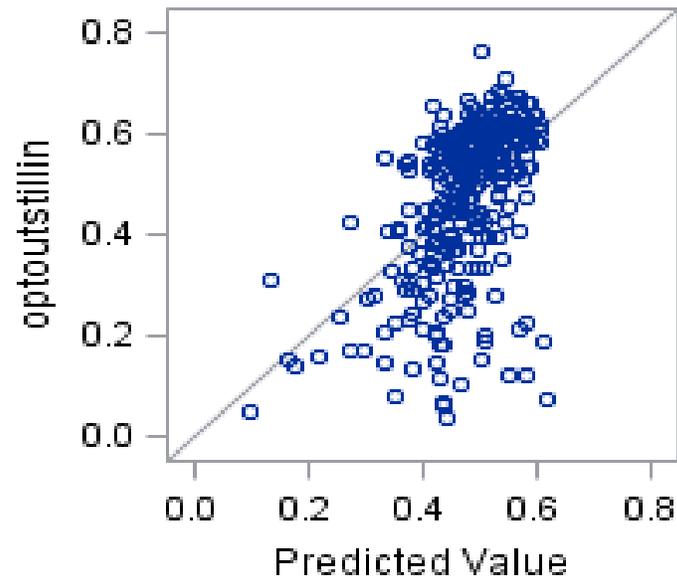


Figure 22: Plot of Actual versus Predicted (LG&E and KU and ACS data) percentage of homes still enrolled in opt-out programs, Adj R-sq=.21



Appendix C: Geographic Analysis

This section displays several maps created by DNV KEMA related to customer characteristics of importance to Smart Meter program acceptance and likelihood of participation and potential achievement of customer benefits. A reference map for identifying counties and cities can be found at:

<http://geology.com/county-map/kentucky.shtml>.

Most of the data reviewed by DNV KEMA was obtained at the zip code level. Survey statistics, however, were often inadequate at the zip code level to reveal meaningful results. In order to overcome this sparse data problem, we create larger geographical groupings based on the 1st 3 digits of the zip code called Sectional Center Facility or SCF, SCFs in order to display the data. The groupings are shown in the Table below.

Distribution of Survey Responses by SCF

SCF	Number of survey responses
400	32
401	11
402	191
403	58
404	25
405	105
406	2
407	6
408	2
409	4
410	14
420	6
423	8
424	10
425	6
426	4
427	12
Grand Total	496

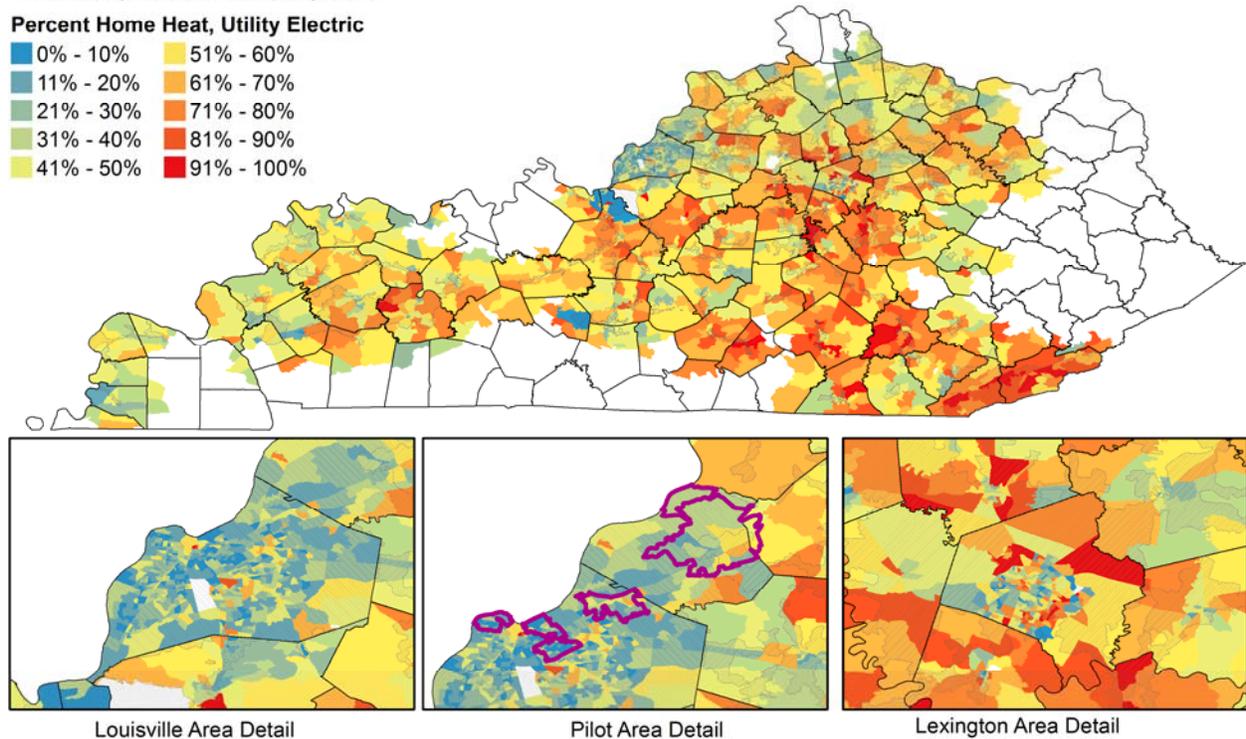


Map of Electric Heat

Louisville Gas and Electric Company (LG&E)
 Kentucky Utilities Company (KU)

Percent Home Heat, Utility Electric

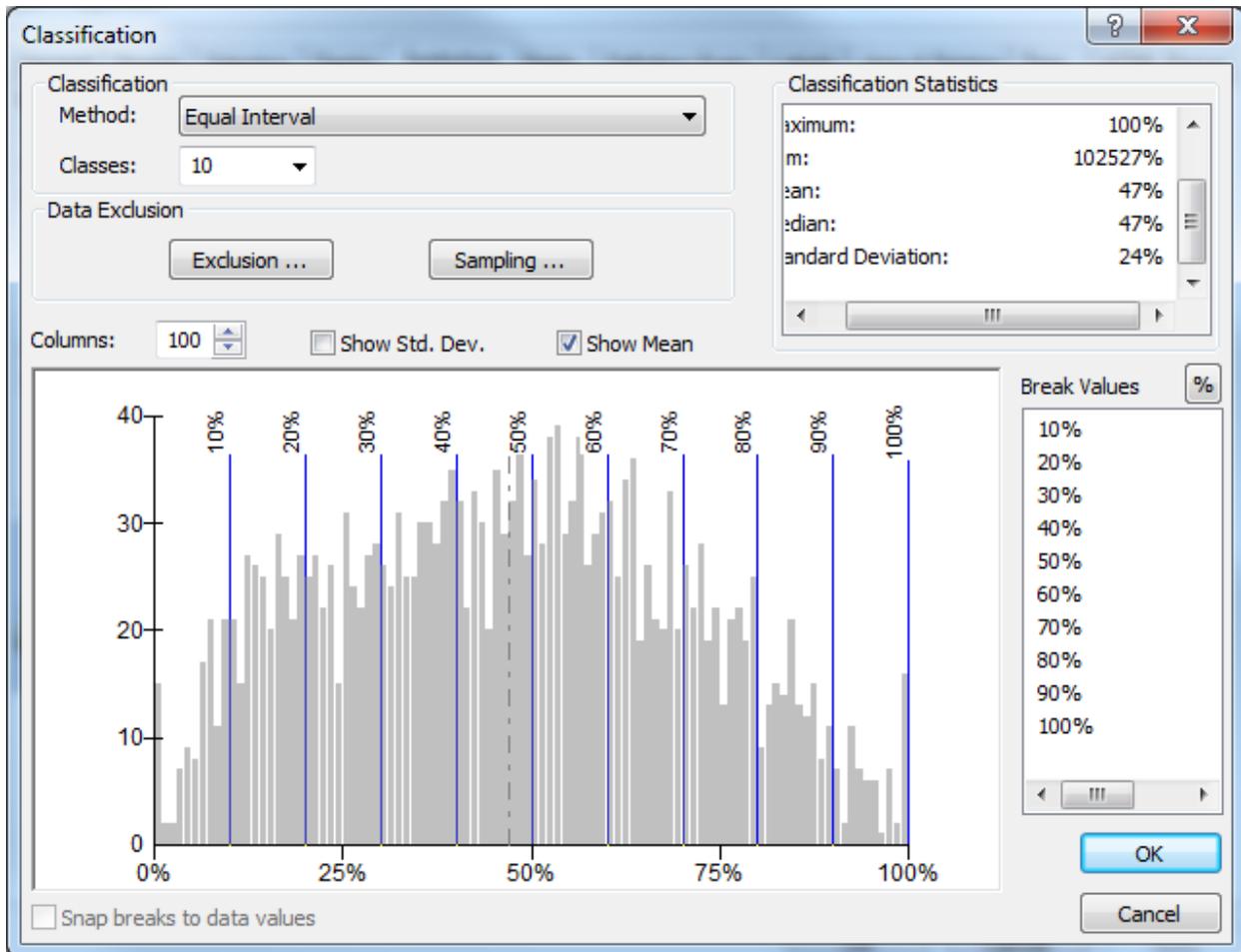
0% - 10%	51% - 60%
11% - 20%	61% - 70%
21% - 30%	71% - 80%
31% - 40%	81% - 90%
41% - 50%	91% - 100%



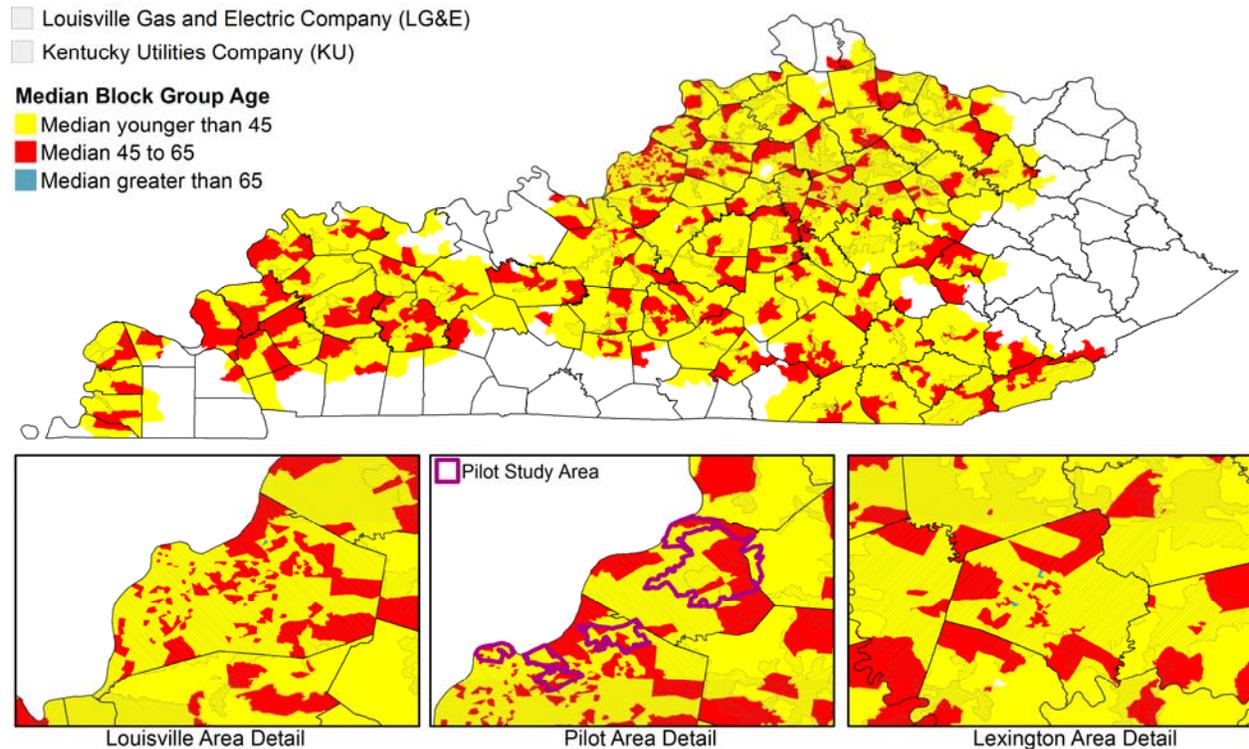
Percent of homes heating with electricity was derived from the 2007 – 2011 ACS. The number of occupied housing units with electricity as a primary fuel was divided by the total number of housing units for each of the ACS block groups. To generate the above map, the utility service territories were used to select only the ACS block grounds that we serviced in part or whole by one of the utility clients.

Key Points:

1. The pilot study area appeared to contain low percentages of homes that used electricity as a heating fuel. This may have impacted consumer expectations and satisfaction of how much electricity Smart Meters would save them, given their lower overall electric burden.
2. KU's southeast service area has a higher proportion of home using electricity as a heating fuel, this bears closer examination.
3. LG&E may be able to capitalize with targeted marketing on the smaller number of census block groups with a large proportion of homes using electricity as a heating fuel.



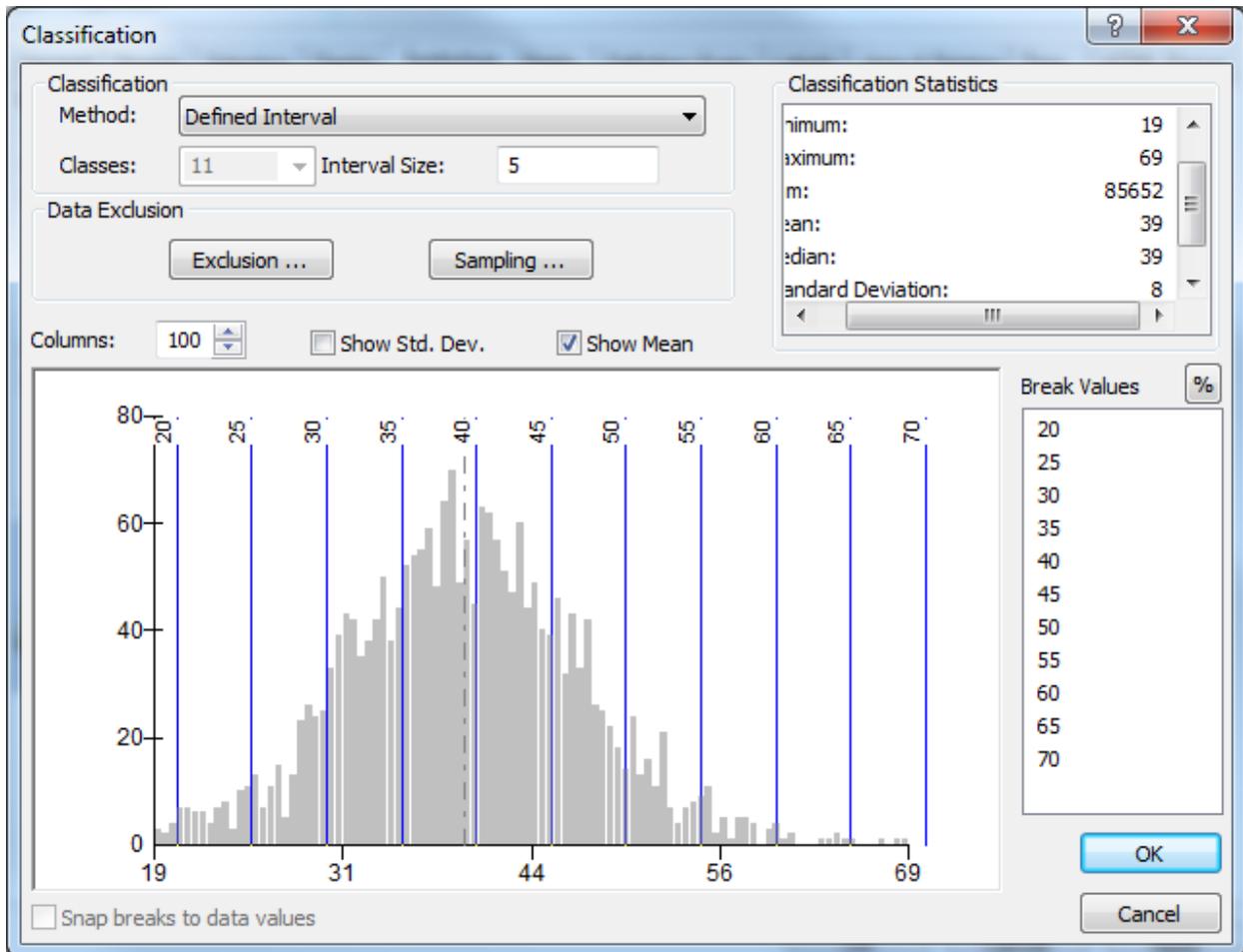
Map of Median Age



Median block group age was taken directly from the 2007 – 2011 ACS. To generate the above map, the utility service territories were used to select only the ACS block grounds that we serviced in part or whole by one of the utility clients.

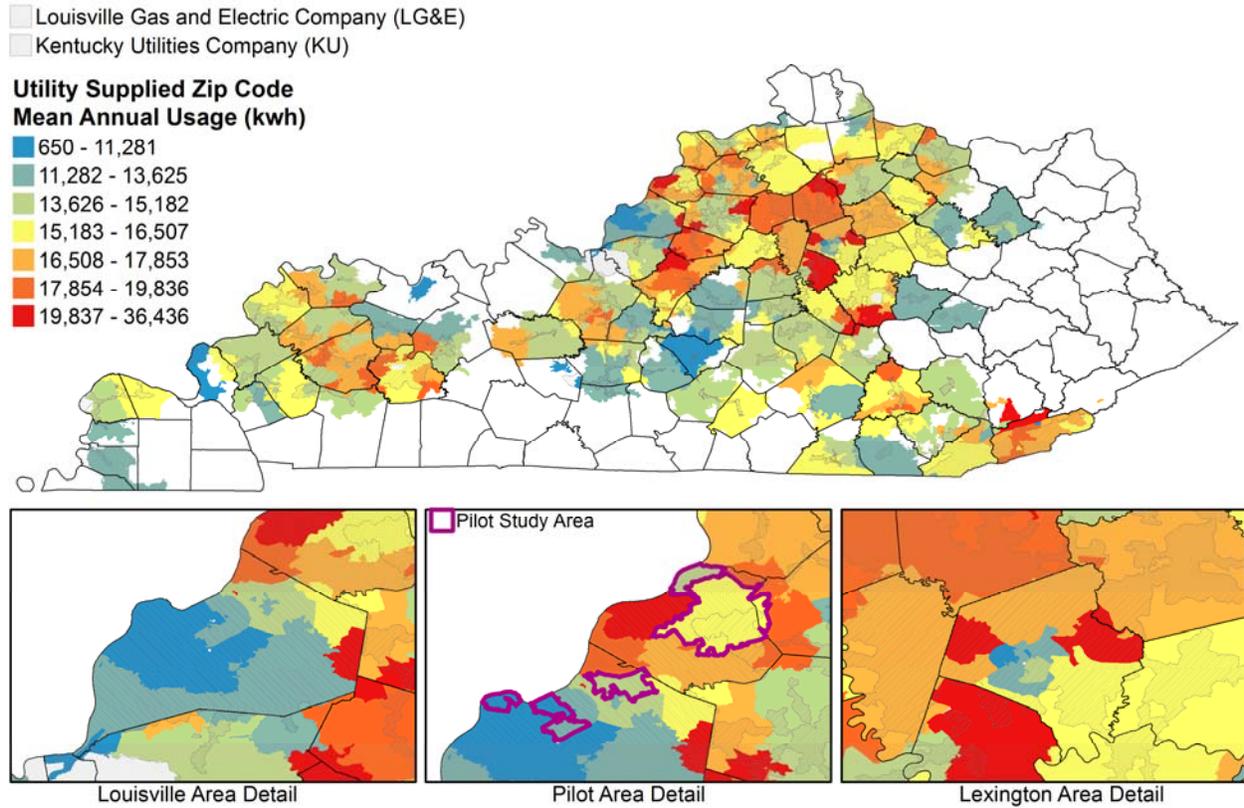
Key Points:

1. The three breaks were used to match the team and client breaks in the analysis of age. That said, if you look at the histogram, the breaks are not ideal based on the data. This does not impact the data, just the visualization on the map.

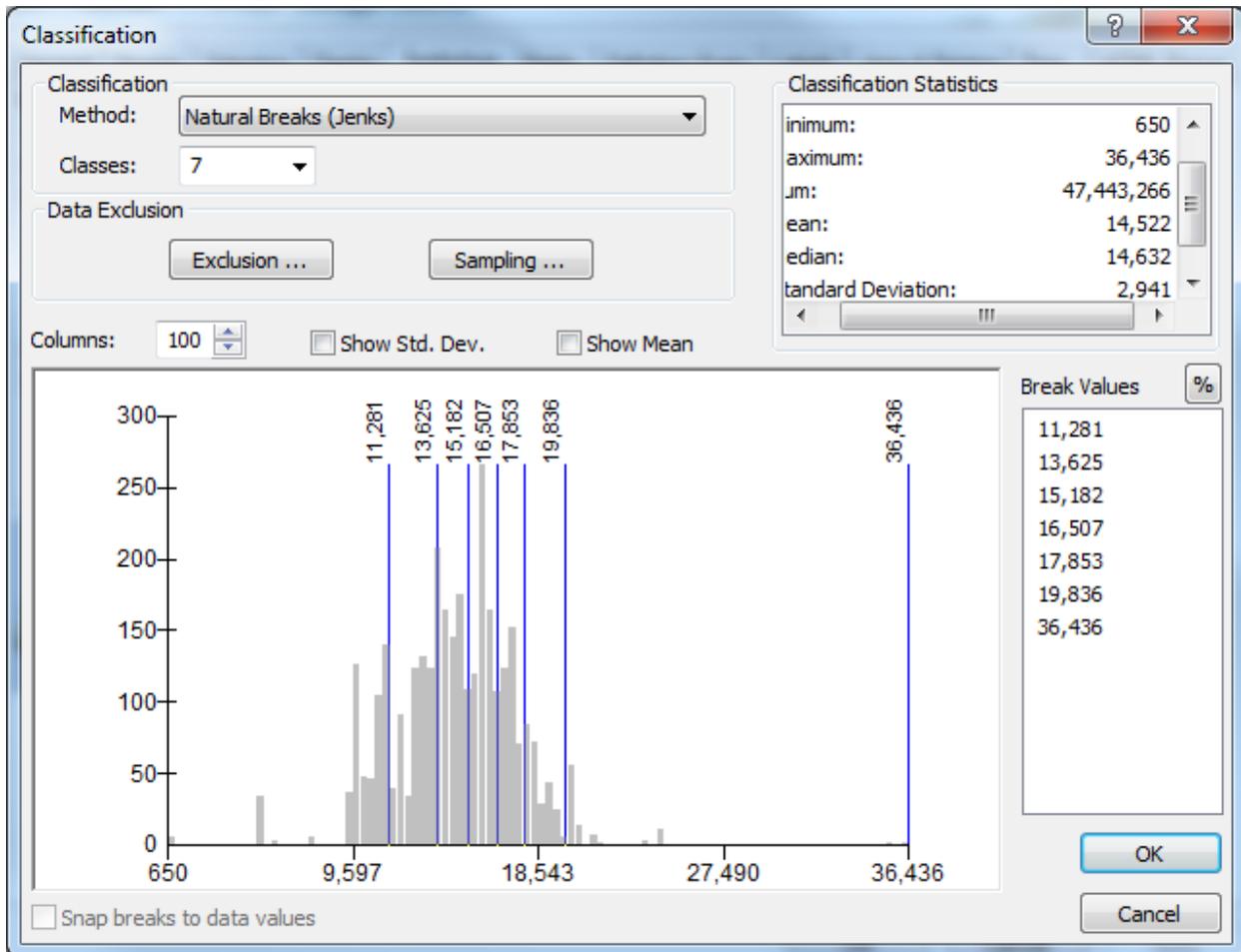




Map of Annual Energy Usage

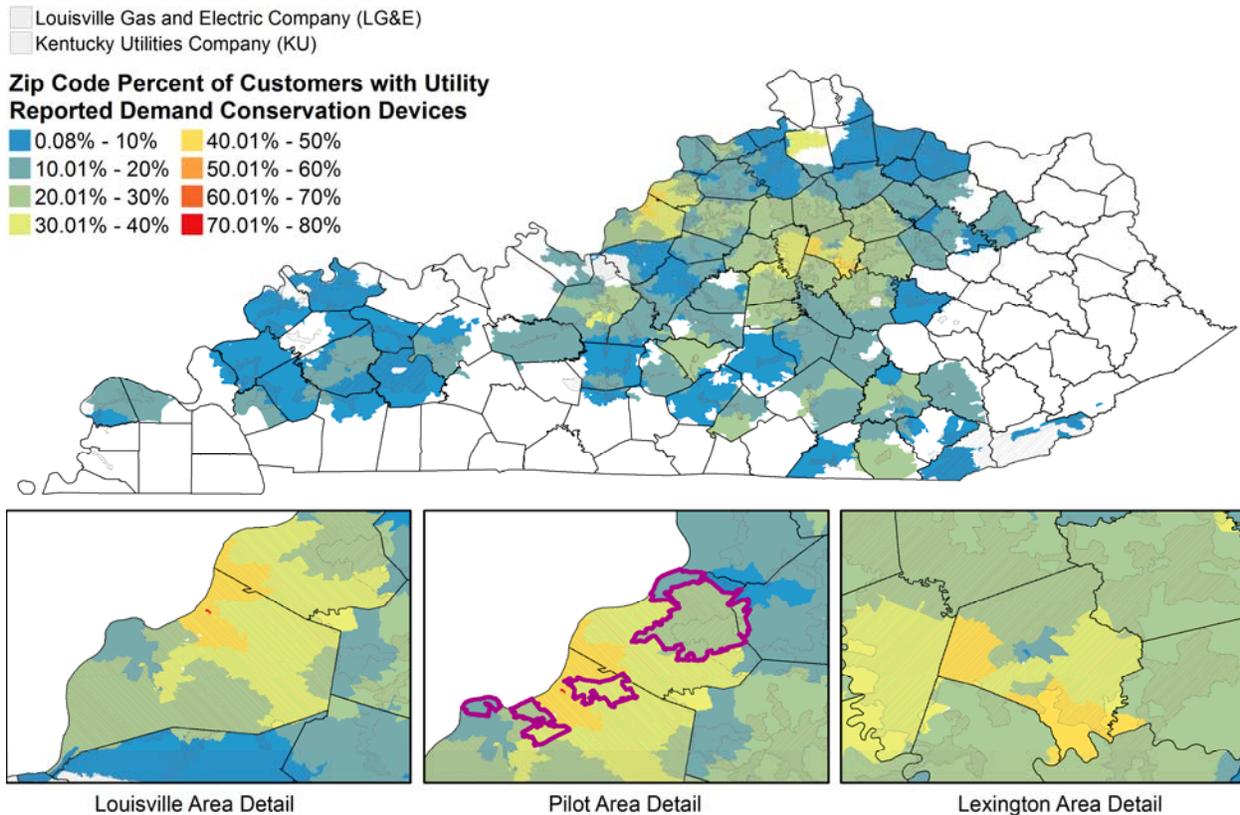


Average annual energy use was taken directly from utility supplied average zip code level annual energy consumption and joining it to the US Census Bureau's 2010 zip code tabulation area files to generate the map above. No additional analysis was performed.





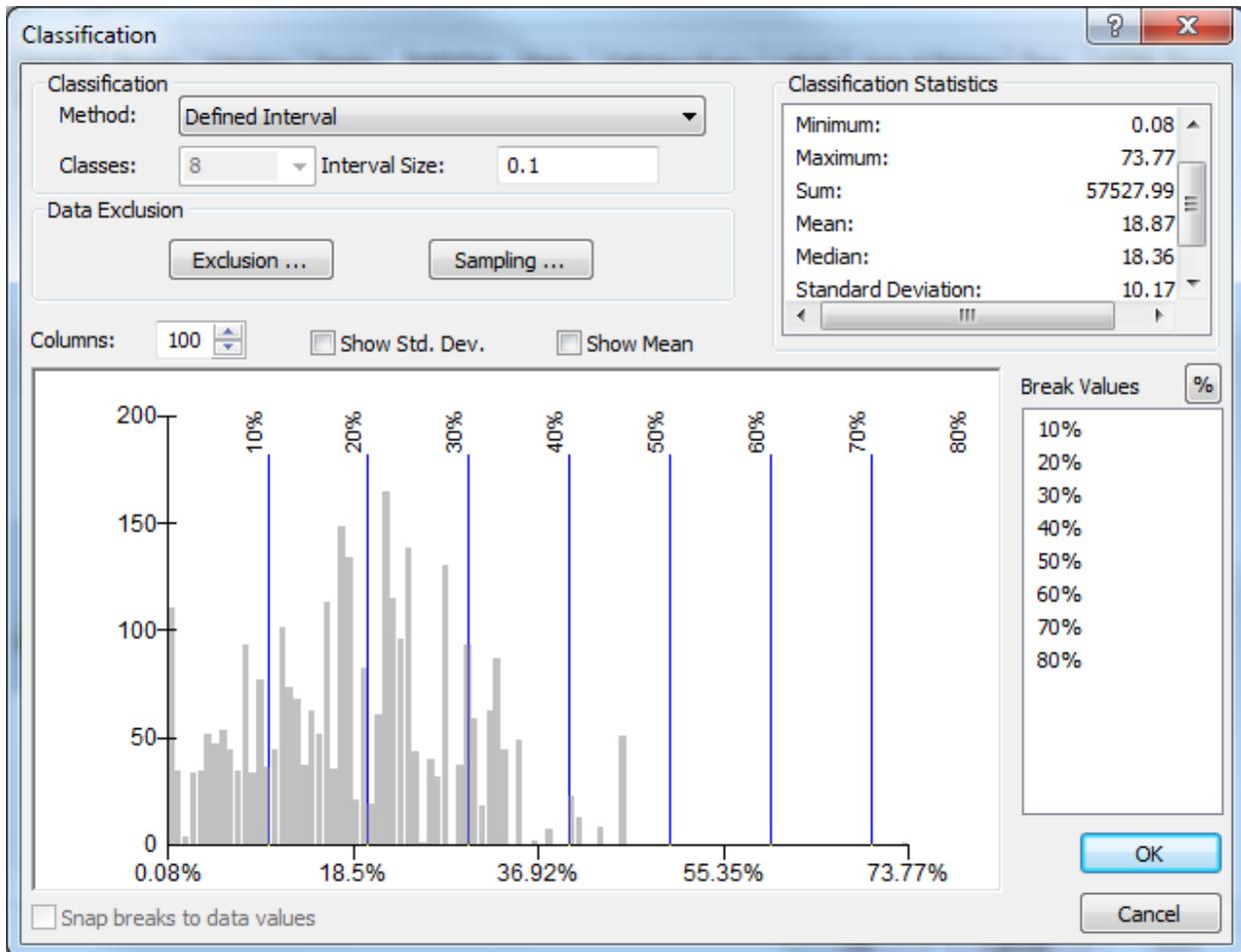
Map of Customers with Demand Conservation Devices



Proportion of accounts with demand conservation devices was calculated by taking the client supplied zip code counts of customer accounts and dividing it by the utility reported number of demand conservation devices for that zip code. The results were then joined to the US Census Bureau's 2010 zip code tabulation area files to generate the map above. For several zip codes, data quality issues meant that the zip code impacted was dropped from the analysis – for example, for KU in western Kentucky.

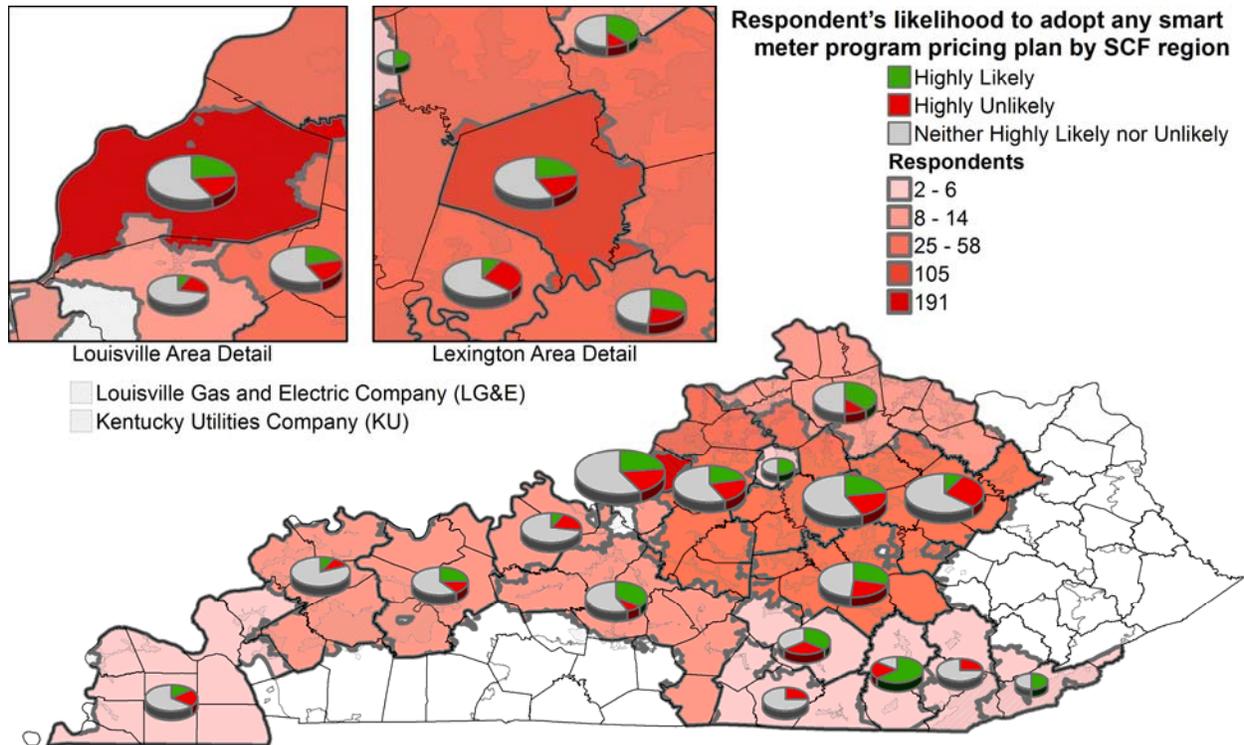
Key Points:

1. Per the histogram – bins 50 percent-60 percent and 60 percent-70 percent are empty. Bin 70-80 percent contains only 1 value.





Map of Likelihood of Adoption



The map was generated by taking the 3 digit level model results and attaching them to 3 digit zip code tabulation areas where they utilities had a service presence.

Key Points:

1. This map would be improved if it could be restricted to just the utility service territory rather than the whole SCF. However, this would require individual customer records rather than aggregated records to the zip code and SCF level.



Appendix D: Costs and Operational Benefits as Reported by Other Utilities

This appendix describes the AMI costs and operational benefits as described in business cases of other utilities. The utilities covered are AEP Ohio, Duke Ohio, Ameren and NES. We also provide a summary of costs and benefits from the Smart Grid Collaborative which reflects the experience of utilities throughout the United States.

I. AEP Ohio

The AEP Ohio business plans extends AMI to approximately 894,000 customers, FLISR on approximately 250 priority circuits and Volt/VAR optimization on approximately 80 circuits.

The primary benefits which were part of the cost/benefit analysis in the business case are as follows:

	15 year cash value	Per Customer Per Year	
AMI financial benefits (meter reading, remote connect/disconnect)	\$83M	\$6.71 - \$7.83 per meter per year	
Credit, collections and revenue enhancements through earlier theft detection, lower consumption on inactive meters and greater billing accuracy	\$111M	\$8.94 - \$11.18 per meter per year	
Volt Var Optimization	\$115M		Requires additional investment in addition to AMI and not quantitatively discussed in this report
Distribution automation circuit reconfiguration outage reduction (FLISR)	\$1.06B		Requires additional investment in addition to AMI and not quantitatively discussed in this report



The AMI costs are estimated to be \$180 per installed meter plus yearly O&M costs. There are additional costs for implementation of FLISR and Volt/VAR control.

The business case is primarily made through the benefits to customers of the FLISR technology.

II. Duke Ohio

The results in this section are from a mid-deployment audit of the Duke Energy Ohio grid modernization project by the Public Utilities Commission of Ohio. The program includes deployment of AMI to about 620,000 customers over a period of 7-8 years.

The primary operational benefits due to AMI are:

	Benefits (20 year NPV – based on an deployment over 7-8 years)	Per customer per year
Off-Cycle / Off-Season Meter Reads	\$54M	\$4.35 - \$5.80
Regular meter reads	\$50M	\$4.03 - \$5.37
Remote meter diagnostics	\$6.5M	\$0.52 - \$0.70
Power theft – Recovery costs	\$7.9M	\$0.64 - \$0.85
Meter accuracy improvement	\$8.5M	\$0.69 - \$0.91
Vehicle Management	\$10.2M	\$0.82 - \$1.10

Significant benefits were also found from Integrated Volt/VAR Control.

III. Ameren

Ameren plans to deploy AMI to 780,000 customers over 8 years. Numerous benefits and costs were computed for a NPV cost/benefit analysis over 20 years.

The costs of the AMI system are as follows:

	Costs based on a 20 year NPV	Cost Per customer
AMI equipment and installation	\$129M	\$165
AMI Operations (over 20 years)	\$69M	\$88



Project management	\$16M	\$20
IT System and Integration	\$294M	\$376

The IT System and Integration costs in the Ameren business plan are significantly higher than reported by other utilities.

The primary operational benefits were listed as follows:

	Benefits each year based on a 20 year NPV	Per Customer per year
Reduction in meter reading costs	\$238M	\$15.25
Reduction in field and meter services	\$209M	\$13.39
Reduction in Unaccounted for energy	\$41M	\$2.62
Outage management efficiency	\$32M	\$2.05
Improved distribution system spend efficiency	\$42M	\$2.69

In addition, other customer and societal benefits were also included in the Ameren business case. The largest customer and societal benefits in the Ameren business case were improved support for demand response and PEVs. The business case for AMI at Ameren was made by considering both the operational and the societal benefits.

IV. NES

NES developed the business case for deploying AMI to its 323,000 customers. It estimated the cost of deploying AMI to be \$188 per customer plus additional O&M costs each year.

NES has partially deployed AMI in its territory. The operational benefits were identified as follows:

	Benefits each year based on a 15 year NPV	Per customer per year
Field Services	\$6.8M	\$21.05
Meter Services	\$2.0M	\$6.19
Billing and Collection	\$1.8M	\$5.57
Call Center	\$0.5M	\$1.54



Distribution Operation	\$0.5M	\$1.54
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V. SGCC Study

The Smart Grid Consumer Collaborative (SGCC) recently released a report on Smart Grid Economic and Environmental Benefits. The results in the report are based on the research done by the members of the collaborative.

The primary operational benefits reported are listed below.

	Benefits per meter per year
Remote meter reading	\$13.68 - \$23.92
Pre-payment and Remote Disconnect/re-connect	\$7.82 - \$19.56
Revenue assurance	\$3.0

There are other benefits discussed in the SGCC study including benefits due to Volt/VAR control and time-varying rates. These are not quantitatively discussed in this report.

The cost of the AMI system is estimated by SGCC to be \$291.54 per customer plus 4 percent yearly O&M costs.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF LOUISVILLE GAS AND)
ELECTRIC COMPANY FOR AN ORDER)
APPROVING A RESPONSIVE PRICING) CASE NO. 2007-00117
AND SMART METERING PILOT)
PROGRAM)

**Responsive Pricing and Smart
Metering Pilot Program Final Report
for
Louisville Gas and Electric Company**

July 1, 2011

Responsive Pricing and Smart Metering Pilot Program Final Report
 Kentucky Public Service Commission Case No. 2007-00117

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Kentucky Public Service Commission Case No. 2007-00117

EXECUTIVE SUMMARY

Louisville Gas and Electric Company (“LG&E”) has completed a three-year Responsive Pricing and Smart Meter pilot program (“Pilot”). The Pilot was designed to provide residential and commercial customers a variable rate schedule for their energy usage and to determine whether customers change their electric usage given either economic incentives or additional information related to their energy cost.

Meeting the requirements of Kentucky Public Service Commission (“Commission”) Order Case No. 2007-00117, the Company has submitted interim reports to enable the Commission to adequately monitor the program. In particular, the Commission expressed interest in data pertaining to the pilot participants’ electrical usage, cost, and overall feedback on the program, as well as the Company’s evaluation of pilot objectives and cost. On an annual basis, the Company collected program data and submitted comprehensive reports with detailed analysis for Commission review. The following final report examines the overall performance of the pilot program and presents recommendations for further demand-response research.

Throughout the three-year pilot, analysis on customer behavior has been performed to measure two key components: (1) the actual energy shift and change in customer behavior patterns, and (2) how time-of-use rates and various devices effected customer satisfaction. Pilot results showed high-quality load reductions for demand response, with load found to shift from higher-priced weekday hours to lower-priced off-peak and weekend time periods. Additionally, customers using in-home devices but not on the time-of-use rates were found to be using almost half of their energy during the low tier of the rate schedule. Those customers who received critical peak pricing (“CPP”) signals shifted their energy use but created a 0.5 – 0.8 kW per customer higher peak than the original system peak and consumed more overall energy.

LG&E has collected, analyzed, and reported on the progress of the pilot program over the last three years. Only about 80 customers remain on the Responsive Pricing rate; others elected to return to the standard rates mostly due to the lack of expected energy savings. The Pilot has provided information on customer behavior patterns and customer satisfaction with time-of-use rates that will be valuable in designing future pilot programs. But after three years of experience with the Pilot’s equipment and rate schedules, LG&E believes it has gleaned all the useful information it can from the Pilot. Therefore, LG&E recommends that the Commission issue an order discontinuing the Pilot and returning the Pilot customers to their standard rates.

Operationally, LG&E has gained valuable experience in recognizing the risks of emerging technologies in smart metering and advanced two-way communications. LG&E seeks to consider developing further experience and methods for deploying these technologies through additional pilots and trials designed to test customer acceptance, use, and cost to benefit analysis. For example, capability to automatically capture, upload, and validate data is vital to providing customers with access to their consumption trends and associated costs, and evaluating consumer

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willingness and ability to conserve energy. Furthermore, such system could enable LG&E to provide customers with access to their data through a variety of virtual based tools thus enhancing the customer value and maintaining continued customer satisfaction. Piloting these solutions would be of crucial benefit to LG&E as their societal value is showing to be very important to broader smart meter activities.

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1.0 INTRODUCTION

On March 21, 2007, LG&E filed an application with the Commission that established Case No. 2007-00117 requesting Commission approval to develop a Responsive Pricing and Smart Metering pilot program (“Pilot”). LG&E planned to use time-of-use rates with a critical peak pricing component and “smart” devices with secure communications to send pricing signals to a test group of customers, allowing them to choose to save money and decrease system demand by shifting their electricity usage away from peak generation system demand periods. The smart devices would also provide information regarding real-time and historical energy usage.

By Order dated July 12, 2007, the Commission approved the Pilot for an initial term of three years that would serve up to two thousand customers. LG&E filed a motion on September 15, 2008 to amend the July 12, 2007 Order to incorporate up to an additional fifteen customers to the approved tariff. The additional customers were to be employees of General Electric Company (“GE”) located on the same routes as the other Pilot customers. The request was made to cooperate with GE’s effort to promote and test demand side management-ready appliances in the employees’ homes. The smart equipment provided by LG&E to the GE employees was identical to the other customers participating in the Pilot. The Commission’s Order dated October 7, 2008 granted authority to include the additional GE employees.

In compliance with the Commission Order in Case No. 2007-00117, LG&E filed 2008, 2009 and 2010 interim reports evaluating the Pilot on an annual basis.¹ This final report summarizes the overall operation and outcomes of the Pilot program. The highlights in this report are intended to inform the Commission with respect to future decisions associated with the Pilot as well as time-of-use pricing construct and associated consumer education initiatives.

1.1 Purpose

The purpose of the three year pilot was to test the hypothesis, “a responsive pricing rate structure consisting of time-of-use and real-time, critical peak pricing components in conjunction with a Demand-Side Management (“DSM”) program will likely maximize demand response for residential and commercial customers in a cost-effective manner.”²

1.2 Background

The Pilot program was designed so that a participating customer with a typical load profile would not experience a change in electricity costs if their usage pattern did not change. However, a customer’s electric bill would decrease if usage shifted from higher-cost peak

¹ Interim reports cover the analysis of data related to customers’ participation, energy usage and costs, load impact and operation of the Pilot, in greater detail.

² *In the Matter of: Application of Louisville Gas and Electric Company for an Order Approving a Responsive Pricing and Smart Metering Pilot Program*, Case No. 2007-00117, Application at 4 (Mar. 21, 2007).

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periods to lower-cost off-peak periods. Likewise, a customer's electric bill would increase if usage shifted from lower-cost off-peak periods to higher-cost peak periods.

The Pilot was intended to include up to one hundred residential customers and up to fifty commercial customers to be enrolled on time-of-use rate structures. To determine if cost savings could be realized by some customers not on the time-of-use rates by using a combination of smart devices, the approved Pilot allowed for up to four hundred customers to be given a combination of such devices to provide the participating customers energy usage information, allowing the customers to change usage to produce cost savings, if desired.

2.0 PILOT DESCRIPTION

2.1 Responsive Pricing

LG&E filed with the Commission a tariff sheet establishing Residential and General Service Responsive Pricing which incorporated a time-of-use rate with critical peak pricing ("CPP"). This Responsive Pricing tariff became effective in January 2008. Responsive Pricing was offered to customers on the six selected routes who had lived at their residences for at least twelve months. Responsive Pricing participation was voluntary and featured four pricing periods (low, medium, high, and CPP) as opposed to a standard customer's flat rate. Low and medium pricing periods had rates lower than the standard rate and made up approximately 87% of the hours in a year. CPP events could occur during hours of high generation system demand for up to eighty hours per year, implemented at LG&E's discretion. Customers received at least 30 minutes notice prior to CPP events, which had a rate of approximately five times that of the standard flat rate. The rate structure and pricing changed depending on the time of year and is detailed below.

June through September			October through May		
Time	Weekdays	Weekends	Time	Weekdays	Weekends
Midnight to 10 a.m.	Low	Low	Midnight to 8 a.m.	Low	Low
10 a.m. to 1 p.m.	Medium	Low	8 a.m. to 6 p.m.	Medium	Low
1 p.m. to 6 p.m.	High	Medium	6 p.m. to 10 p.m.	High	Medium
6 p.m. to 9 p.m.	Medium	Low	10 p.m. to Midnight	Low	Low
9 p.m. to Midnight	Low	Low			

2.2 Smart Devices

The Pilot utilized four kinds of smart devices: smart meters; programmable communicating thermostats; in-home energy usage displays; and load control switches. Customers participating in the Responsive Pricing group (including the GE group) received all available devices listed above. The remaining Pilot customer groups received a choice of up to three in-home devices in addition to the smart meter. GE employees participating on the Pilot received a suite of GE

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“smart” appliances — or Demand Response appliances — to replace their standard appliances.³ In most cases, this included a refrigerator, range, microwave, dishwasher and a laundry pair. In-home devices and “smart” appliances received a signal from the smart meter which alerted the participants, when high and critical peak pricing periods were in effect. The appliances were programmed to avoid energy usage during that time or operate on a lower wattage. Similarly, the thermostat was automatically set so that less air conditioning was used during high and critical peak pricing periods, while load control switch was programmed to shut off water heater operation or a pool pump during these periods. Customers had the ability to override such settings if they so desired by accessing the devices directly or via website.

2.3 Customer Groups

The Pilot included several combinations of smart devices to determine the impact of various types of tools and energy cost information on customers’ energy usage. Customers residing on the selected metering routes who did not volunteer for Responsive Pricing were eligible to receive one or more smart devices. Over the course of the Pilot, approximately 95 customers chose programmable thermostats and in-home energy usage displays; approximately 20 customers chose programmable thermostats and/or load control switches; and approximately 90 customers chose in-home energy usage displays only.

2.4 Pilot Implementation

LG&E assessed metering routes in 2007 in an effort to deploy the Pilot in areas representative of the entire service territory. Six routes were selected to include city and rural environments. A summary of criteria used in selecting the routes is presented in the following table.

Criteria	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6
Customer Density	High	High	High	Moderate	Moderate	Low
Foliage Density	Moderate	Moderate	Moderate	Low	Low	High
Terrain Dynamics	Low	Low	Moderate	Moderate	Moderate	High
Customer Variety	Low	Moderate	Moderate	High	High	Moderate
Property Size	Low	Low	Moderate	Moderate	Moderate	High

The “Customer Variety” criterion in the table above relates to energy usage, customer type (residential and commercial), and building size. The “Property Size” criterion relates to the acreage of the property.

³ LG&E was only responsible for providing GE employees with the smart meter and in-home devices, while GE exclusively supplied “smart” appliances.

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LG&E contracted with Trilliant, Inc. ("Trilliant") to be the hardware supplier for the Pilot. Trilliant was responsible for installing the communications network and provided communications cards for the smart meters, as well as the in-home devices discussed herein. LG&E contracted with GoodCents Solutions ("GoodCents") to install the smart devices. The smart meter communication network deployment began in September 2007 and GoodCents began installing smart devices at customers' residences and businesses along the selected routes in November 2007. All electric smart meters and the communication infrastructure were installed by the end of January 2008.

The initial marketing efforts were directed toward customers interested in the time-of-use rate. The goal was to have this group identified, equipment deployed, and customers educated prior to the summer of 2008. The original application suggested that the Pilot would be deployed within six months of approval. However, the challenges of smart metering being an emerging technology, being a new program to both LG&E and our customers, equipment availability and attracting participants ultimately delayed device deployment. The total number of Responsive Pricing participants peaked at 104 by the end of the year 2008. However, at the end of 2009 the participation level slowly began to decline with a total of 80 Responsive Pricing customers still remaining in the program. Fifty percent of customers who requested to be removed from the Responsive Pricing program reported very marginal savings, if any, and did not want to continue participating. The remaining contingent of customers who asked to be removed from the Responsive Pricing program reported moving from the residence; purchasing a new HVAC system or a new suite of appliances; or not wanting to continue participating after one year of activity.

3.0 PILOT OPERATIONS

3.1 Customer Marketing

The primary marketing and education campaigns in 2008 were directed toward developing the Responsive Pricing customer group. Moreover, six marketing efforts were deployed in an effort to enroll eligible customers into the remaining Pilot groups. LG&E utilized a variety of communication techniques and messaging (i.e. four direct mail campaigns, one telemarketing effort, and door-to-door participant recruitment on identified routes). Overall, these efforts yielded approximately 200 customer enrollments. However, LG&E's objective to have all the customer groups fully subscribed and their equipment deployed was not fully realized. LG&E found only low customer receptiveness to multiple marketing campaigns. Consequently, LG&E learned that developing additional marketing strategies to enroll the remaining participant groups was no longer appropriate and decided to cease further marketing efforts.

Overall, LG&E recognized that there is the need to further study different customer segments and the need to understand how customers will actually behave in terms of various marketing and education efforts on energy consumption, load reductions and energy management tools.

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3.2 Customer Education and Information Feedback

LG&E evaluated various methods of communication, interaction and feedback between the Responsive Pricing customers and the company in an effort to provide more direction to pilot participants with their energy consumption.

3.2.1 Usage Reports

LG&E performed a bill comparison analysis for each of the Responsive Pricing customers based on their individual energy usage behaviors over the summer periods. LG&E supplied personalized customer usage reports to the Responsive Pricing customers in an effort to help them better understand what measures to take in order to shift their usage from the High and Critical rate periods. The customer reports established that an average Responsive Pricing customer experienced a 1.4% bill decrease for the summer billing period. Also, the customer reports established that 17% of the Responsive Pricing customers were almost bill neutral. Customers, who decided to no longer participate, informed LG&E that the opportunity for energy cost savings was the main reason they had signed up.

3.2.2 Consumer Website

LG&E provided a web site for Responsive Pricing participants to obtain program information and guidance on optimizing their energy consumption on an individual basis. Website covered variety of topics, including the Responsive Pricing bill layout; critical peak pricing preparedness; energy efficiency tips; and the transition between pricing schedules. LG&E found the level of interaction from the Responsive Pricing Participants to be very low by monitoring the frequency of site traffic.

3.2.3 Bill Information

LG&E implemented a bill format specifically designed for Responsive Pricing participants. The bill included specific information about Responsive Pricing participants' energy usage during each rate period as well as their total energy usage. For comparative purposes and in an effort to allow participants to make the best use of the Responsive Pricing program, the bill also presented information on how Responsive Pricing electric charges compared to the standard electric rate charges.

3.2.4 Consumer Support

LG&E provided both telephone and email support for Pilot participants. The phone support was available from 8:00 a.m. – 5:00 p.m. Callers were knowledgeable about and involved in the management of their energy usage. In addition, callers indicated that they were using their participation on the Pilot as a way to gain more control over their energy usage. LG&E also received calls from non-participants who wanted to know about smart meters in general.

Participants also used the email support feature of the Pilot to resolve concerns related to their participation. These customers had wide-ranging questions regarding critical peak pricing and

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billing information. Where appropriate, inquiries were forwarded to a designated contact at LG&E to be addressed.

3.3 Critical Peak Pricing Events

LG&E initiated nineteen critical peak pricing events in total as summarized in the table below.

Summer CPP Event Log			
Year	Date	Time (EST)	MAX Temperature (°F)
2008	July 18	16:00 - 18:00	92
	July 21	16:00 - 18:00	89
	August 11	16:00 - 18:00	79
	August 12	16:00 - 18:00	81
	September 4	16:00 - 18:00	86
2009	June 2	15:00 - 19:00	89
	June 19	14:00 - 18:00	91
	June 24	14:00 - 18:00	91
	June 26	14:00 - 18:00	92
	July 28	14:00 - 18:00	82
	August 26	14:00 - 18:00	89
2010	June 17	15:00 - 19:00	90
	June 18	15:00 - 19:00	93
	June 22	15:00 - 19:00	93
	June 23	15:00 - 19:00	94
	June 25	15:00 - 19:00	91
	July 15	15:00 - 18:00	94
	July 23	15:00 - 18:00	95
	August 10	15:00 - 19:00	100

3.4 Field Equipment

The Pilot implementation and operations have been successful. The equipment and communication technologies deployed have achieved the purposes of the pilot. Nevertheless, the Pilot infrastructure is starting to exhibit signs of degradation through irregular hardware malfunctions and sporadic network performance. LG&E has learned that the functioning of smart meter network infrastructure can be unpredictable, especially in rural areas. However, LG&E recognized that there were areas of identified metering routes where the costs associated with deploying additional network equipment to improve system performance may not have been economically justifiable. LG&E has acknowledged the need to evaluate different variations of emerging technologies on a periodic basis. Since this process was not warranted within the scope of the Pilot, LG&E believes such evaluations will be necessary to allow for the development of ongoing quality control and understanding of potential interoperability issues and implementation risks as new technologies and standards continue to develop.

4.0 PILOT RESULTS

4.1 Demand Response Impacts

The analysis of the three summers of data demonstrates participating Pilot customers consistently decreased their energy usage slightly in high and critical peak pricing periods; however,

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Responsive Pricing customers used more energy overall throughout the summer periods compared to non-Responsive Pricing customers.

Average demand reductions during CPP events varied from 0.2 kWh to over 1.0 kWh per participant during high-temperature periods. Overall the Responsive Pricing load reductions were greatest in the first hour of the critical peak pricing period and then decreased throughout the evening. Customers were beginning to use the appliances or turning up the air conditioning before the critical peak pricing period was over. The daily load profiles for the average Responsive Pricing customers changed and resulted in daily demand being shifted from high-priced hours to lower-priced hours. Based on a comparison of the average hourly energy usage between the Responsive Pricing group and Control group, load was found to shift from higher-priced weekday hours to the lower-priced off-peak and weekend time periods.

Average load bounce-back was greater on days when the critical peak pricing period was in effect for four hours than on the days when the critical peak pricing period was in place for three hours. The maximum average load increase after CPP was released amounted to 0.8 kW. LG&E recognizes that varying the total system load through added communications technologies between the utility and premise equipment may mitigate negative results related to bounce-back. However, the overall effect from these technologies is still unknown and will have to be evaluated through additional tests and trials.

LG&E found that load reductions can be achieved through implementation of time-of-use pricing and CPP events. Moreover, customers on the Responsive Pricing Tariff were receptive to pricing signals as evidenced by the shifts in their energy usage. In addition, customers were willing to receive information and communication to inform them on the impact of their existing behaviors and areas for improvement. Nevertheless, LG&E acknowledges that further studies would be required to investigate how customers process and apply such information on a daily basis.

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4.2 Participant Usage and Cost

Responsive Pricing customer usage data is detailed in the following table. Pilot participant 12-month historical usage (i.e., usage prior to beginning of Pilot) and Pilot usage are included. The data is displayed in kWh usage and billed cost for minimum, maximum, and average per participant. Minimum and maximum values are based on average monthly usage by participant for each specified time period. Costs are total customer electric billed costs. A customer's usage for each period can vary for many reasons and depends on when the customer enrolled in the program (i.e., electrical usage in cooling season will generally be higher than heating season because air conditioners use large amounts of electricity and many customers' heating units primarily use natural gas).

Responsive Rate Participant Usage and Cost		Monthly Energy Usage (kWh)			Monthly Total Billed Cost (\$)		
		Minimum	Maximum	Average	Minimum	Maximum	Average
12 Months Prior to Pilot	2007	335	2,942	1,273	31	280	99
Pilot	2008	435	3,631	1,503	33	409	113
	2009	116	3,400	1,296	17	213	93
	2010	111	3,293	1,422	19	226	110

4.3 Customer Research

Based on the assessment conducted by an outside market research firm, the Responsive Pricing program was found to be having a considerably positive effect on customers. Program data as well as customer testimony indicated that the program had influenced the following: awareness of home energy consumption; motivation to change behaviors related to energy usage; understanding of ability to control energy consumption behaviors; and willingness to be accountable for home energy usage. Furthermore, the Responsive Pricing program resonated best with a customer base that is already demonstrating a high level of activity and belief in the practice of home energy conservation and efficiency.

The most functional and cited reason for initial enrollment and satisfaction with the program was the prospect of saving money. Therefore, it should not be surprising that a customer's reported satisfaction with the program was highly correlated to their ability to quantify actual savings on their energy bill. Customer satisfaction results ranges included: 62% of customers being "extremely/very satisfied"; 29% of customers being "somewhat satisfied"; and 9% of customers "not very/not at all satisfied". As it relates to saving money on energy bills, while the majority (57%) believed the program had saved them money, there was a notable contingent (43%) that thought otherwise. When customer perceptions were compared with actual billing data, the reported perceptions were justified. Analysis of the billing cycles of June and September for the Responsive Pricing customer and standard residential rate customer, exhibited an average difference of \$4.60 over the four-month billing cycle in favor of Responsive Pricing customers.

While financial savings were a significant point of the Responsive Pricing program, providing a sense of "consumer control" was actually found to be the more powerful motivator for influencing ongoing customer engagement and retention.

LG&E recognizes that ongoing customer engagement and behavior will require further understanding and evaluation to ensure active customer participation, participant education and retention. Furthermore, LG&E believes that in order to continue understanding and evaluating customer perspectives of emerging technologies and energy management, further trials will be required.

4.4 Revenue Impact

LG&E collected customers' billing data to determine the revenue impact from the Pilot program. This data is detailed in the table below.

Pilot Revenue Impact	Amount Collected (\$)		
	Basic Service Charge	Energy Charge	Total
Standard RS/GS Rate	11,885	179,646	191,531
Responsive RS/GS Rate	22,093	163,861	185,954

LG&E believes that recurrent tariff adjustments may be required in order to effectively assess customer adoption and maintain revenue neutrality.

5.0 RECOMMENDATIONS

The Pilot has provided valuable insight to the operations of smart meter network infrastructure. Above all, LG&E has learned that network performance can be largely dependent on terrain topography. Natural barriers such as foliage and the distance between the meters and backhaul communications equipment in remote areas of service territory are crucial variables which will require further evaluation. Furthermore, additional pilot programs would provide LG&E with an opportunity to exercise new and emerging technologies in metering and network communications, which could help overcome the aforementioned geography-specific barriers.

LG&E has gained significant knowledge about customer consumption, rebound of energy usage following or in anticipation of price reductions after peak pricing, and energy efficiency achieved by some customers though only providing information through in home displays. Nonetheless, LG&E suggests that in order to enhance the customer relationship, a higher level of guidance and direction be provided through additional pilot programs. These additional pilot programs may be completely new programs designed to advance understanding of rate design and impact on customer behavior simultaneously with implementing new technologies.

Continued focus on smart meter technologies by utilities and regulators across the country suggest that preparing for deployment through building integration and deployment capabilities must remain a key strategic consideration. LG&E believes that providing customers with technologies and detailed usage information, coupled with education, will empower them to make decisions about their personal energy consumption. Overall, customer education across all segments is required if demand response and variable rate structures are to be expanded or made a condition of service. This education effort would need to focus on both how the programs function and what the potential benefits are to the customer. Furthermore, an emphasis should be placed on how the utility is a partner to the customer in demand-side management, as results could include mutual system-wide improvements to overall cost-effectiveness and reliability of service. Acceptance, understanding, and use of these technologies to change consumption patterns required to achieve savings related to investments affect all customers' bills.

Integration and management of system and customer data through new pilots and trials will provide LG&E with the ability to analyze warehoused information in a manner that provides sustainable options for customers including demand response and demand side management. While the Pilot had been designed to test advanced two-way communications technology for automated meter reading, LG&E was unable to utilize and evaluate fully computerized meter data management system capabilities, given that such systems were not readily available and economically feasible during the Pilot deployment. Today however, these systems are not only readily available, but also scalable enough to handle trials and pilots alike at a fraction of the cost of a fully implemented system. Consequently, LG&E plans to continue evaluating methods for converting the data to information through a knowledge and management life cycle in which the data from smart meters are analyzed and integrated in a manner that leads to action. LG&E intends to develop a data-to-information-to-action plan as a better understanding of customer energy usage patterns, customer acceptance of multiple rate designs, infrastructure condition and performance of new intelligent technologies, emerges through additional pilot and trial analysis and is integrated as functional information into usable customer and demand side management programs as well as operation and maintenance strategies that identify, trend and alert LG&E's grid operators.

The Pilot consisting of approximately 2,000 meters is now complete and LG&E seeks that the Commission discontinue this pilot. LG&E would maintain existing meters in place and begin collecting meter reads through normal meter reading operations to ensure constant operational performance and continuous customer service. Pending Commission approval, LG&E would communicate the end of the Pilot with the remaining Responsive Pricing customers and reinstate these customers on standard rate schedule. Furthermore, LG&E would plan to provide the Responsive Pricing customers with an opportunity to participate in future time-of-use rate pilots, if they so desired.

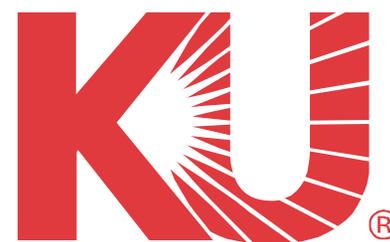
LG&E believes that pilots and trials designed to understand customer behavior (i.e., acceptance, use, sustainability of savings, etc.) and investigate emerging technology integration into existing system infrastructure should be continued.

Moreover, LG&E recognizes that customer education about the benefits of energy efficiency and specifically smart technology is critical to gaining consumer acceptance and employment of this technology. Across the country, multiple utilities have implemented demand response programs and dynamic pricing pilots. While the results of these pilot programs varied widely, the key premise among the utilities focused on the need to further study how programs apply differently across customer segments, and the need for more insight into customer behavior. Consequently continued and new efforts focused on customer education via multiple rate offerings should be evaluated.

The purpose of the objectives discussed below is to provide the Commission a shared understanding of LG&E's position and overall insights to be attained by conducting additional pilots and trials. LG&E seeks to develop internal capabilities to deal with changing smart meter technology and its integration into LG&E's existing system infrastructure prior to large or full-scale deployment of smart meters. The goals of the additional pilots are to: (1) develop a further understanding of customer perspectives (value and perception) of smart meter technology by providing customers with access to their data through a variety of smart tools and web based interfaces to determine customer value and overall impact on acceptance of energy efficiency; (2) develop an understanding and experience of how selected meter data management systems will interface with LG&E's current IT infrastructure; (3) develop an understanding of the progressive change in metering, communications and data management technologies over time, ongoing quality control and potential interoperability, implementation and standards issues; (4) develop an understanding and experience of multiple rate offerings by providing customers with optional rate choices, rate comparison tools and access to energy usage data; and (5) develop experience and techniques for deploying smart meter technologies and communications systems in rural service areas, and evaluate convergence of such infrastructure with existing direct load control program to ensure a sustainable demand response solution.

While the Company seeks to discontinue the current Pilot, LG&E plans to continue its efforts in the area of dynamic pricing and smart metering by developing and refining plans to address issues of standards and revenue recovery, and strategically monitoring and testing smart meter technologies and time differentiated rates to ensure that deployment does not outpace technology, customer adoption, and overall value of providing such capabilities to consumers.

Residential Smart Meters Study



Prepared by:

Bellomy Research, Inc.

January 17, 2012





Objectives



Objectives:

The overall objectives of this study are to understand how much LG&E/KU Residential customers understand about Smart Meters and how willing they would be to participate in a Smart Meter program if offered by the utility. Specifically, the study will evaluate:

- Overall awareness of Smart Meters
- Likelihood to participate in a Smart Meter program
- Appeal of potential rate concepts offered in a Smart Meter program
- Interface tools that would be most important to participation
- Customer attitudes that could impact participation

Results from the study will be used to develop an initial Smart Meter offering, although further research will be necessary to fine-tune the program.



Methodology



Interviewing for this research was conducted via the Internet utilizing sample provided by LG&E/KU. The survey was approximately 15 minutes in length.

BRI sent email invitations to Residential customers requesting their participation in the study. The email invitation contained a survey link allowing them to directly access the survey online 24/7.

Sample provided by LG&E/KU contained Residential customers with an email address. These customers were further screened to ensure that the person who is the utility decision-maker was interviewed.

The data collection period was from 12/5/11 through 12/16/11.

Statistical testing was conducted at the 95% confidence level and significant differences are noted.



Methodology



Quotas were set to 500 total; balanced by utility and for three age groups in order to ensure the results were representative of the LG&E/KU population. Given much lower internet penetration among the 65+ group some completes were shifted to younger households, which also aligns better with potential Smart Meter technology usage.

Due to this being an internet study (and only customers providing email addresses were included), it should be noted that this study is reflective of both the LG&E/KU population and internet usage, and does not necessarily represent the entire LG&E/KU customer base (those without internet access).

The study fell short by 4 completes but remained representative. The final number of completes is as follows:

	LG&E	KU	Total
18-44 years	74	98	172
45-64 years	115	154	269
65+ years	27	28	55
Total	216	280	496



Methodology – Block Design



In order to evaluate the four rate options, a complete block design was used with respondents evaluating all four options. In this design, order is controlled so that each option is rated in each position (1st, 2nd, 3rd, 4th) by an equal number of respondents.

Rate Options Evaluated:

- Time of Use
- Critical Peak Pricing
- Peak Time Rebate
- Inclining Block

Customers were asked to rate each of the options on likelihood to participate, ease of understanding, ease of making changes in energy usage, and motivation to lower usage. All ratings were based on a 5pt scale.

Each rate option included a simplified description, along with a diagram to further aid in describing the concept. (see Appendix)



Methodology – Take Rate

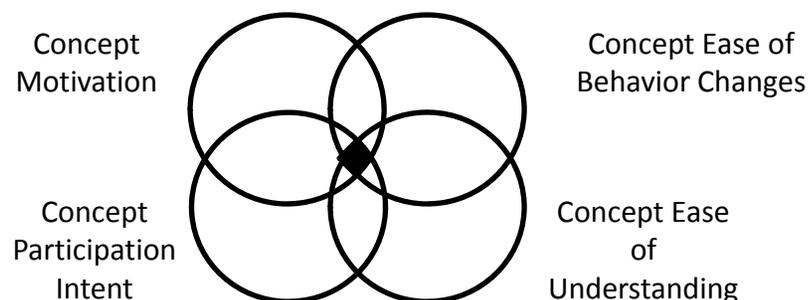


The four rate options were then compared against each other using Bellomy’s “Take Rate” analytical approach, which is ideal when more than two alternatives are being considered and a relative “winner” is desired.

Take Rate is a modified “trial” rate which estimates the percent of respondents who are most committed to a concept idea, providing a more conservative and realistic estimate of customer intent/potential commitment than overall opinion alone.

Take Rate is calculated using the intersection of three to six key variables. Consumers most interested in a concept are identified because they rate the idea high across multiple key measures, not just one. In this case 4 key metrics were intersected:

Take Rate Definition (Top 2 Boxes)





Key Conclusions



Smart Meter unaided awareness is low, with only one in four LG&E/KU customers having heard of the technology, although LG&E customer awareness was ahead of KU.

- Even among those who claimed awareness, many couldn't articulate what the benefits or even the disadvantages of Smart Meters are, indicating they have heard the terminology but have little/no understanding of the concept. However, those with a better understanding noted the key benefits as the ability to track electricity usage, conserve energy and save money.

Although awareness is low, once a customer was provided more information about the program over half stated they would likely participate. Participation levels vary by age, with greater participation more likely among younger households.

Customer attitudes also play a key role in participation. Customers with higher energy conservation awareness and who are technology driven are more likely to participate.

- Conversely, customers that don't think reducing energy is important and are willing to pay for comfort are less likely to participate.

Over half of customers are already adjusting their thermostat. And most customers who are not adjusting it now would do so if it would lower their utility bill, particularly younger households where both adults work full-time outside the home.

The key price point motivating customers to change their usage behavior was monthly savings of \$25 off their utility bill, although just under half would be satisfied with savings of at least \$20.

- Customers who are skeptical about the program and not likely to participate require higher dollar savings to make behavior changes.



Key Conclusions



Of the four rate options evaluated, Peak Time Rebate was the clear winner with a significantly higher “Take Rate” than the other three options.

- Peak Time Rebate also rated significantly higher than any other option on likelihood to participate, ease of making behavior changes and motivation to lower usage/save money.
- However, “Take Rates” among customers 65+ years old were fairly comparable for Peak Time Rebate and Time of Use. They found Time of Use easiest to understand, but rated Peak Time Rebate most motivating.
- The least favorable rate option was the Inclining Block, rated as the most difficult to understand and also scoring low on ease of making usage changes.

Tracking and alerts are key features customers want as part of a Smart Meter program. The top two preferred features were the ability to track electricity usage on an in-home display or online. The next most important feature was Email alerts when higher rates would start to apply.

- Although younger customers prefer Smartphone features over Email, older customers prefer Email driven by lower Smartphone penetration. Offering options will meet varying customer preferences.



Implications



A Smart Meter offering by LG&E/KU that would drive the greatest acceptance would include:

- A Peak Time Rebate rate (if implementation of this rate plan is not feasible then the Time of Use rate could be considered)
- The ability to track usage either on an in-home display and/or online, also offer a Smartphone tracking app which would appeal to younger customers
- Email alerts when higher rates apply, with the option to sign up for text message alerts
- The ability to adjust the thermostat online, with the option to use a Smartphone app
- Monthly utility bill savings of \$25 on average

Building awareness of Smart Meters and educating customers of its benefits will be key in driving participation. Currently, even those claiming to be aware of the Smart Meter terminology do not fully understand its benefits.

- Thus far the utility has played a key role in exposing customers to the Smart Meter terminology, but more education is needed on what it means.
- Barriers such as loss of control, system malfunctions, uncomfortable temperatures and lack of privacy should be addressed openly.
- In general, raise energy conservation awareness across all customers.

Older, retired customers present more of a challenge in gaining acceptance. They are more likely to be home during the day and are less likely to adjust their thermostat until night.

- Temperature control may not be as appealing to this demographic group, however they can be educated on other ways to shift their energy usage such as when they use their appliances. They are more likely to use appliances during peak hours but might have more flexibility to make changes to this usage pattern.



Detailed Findings

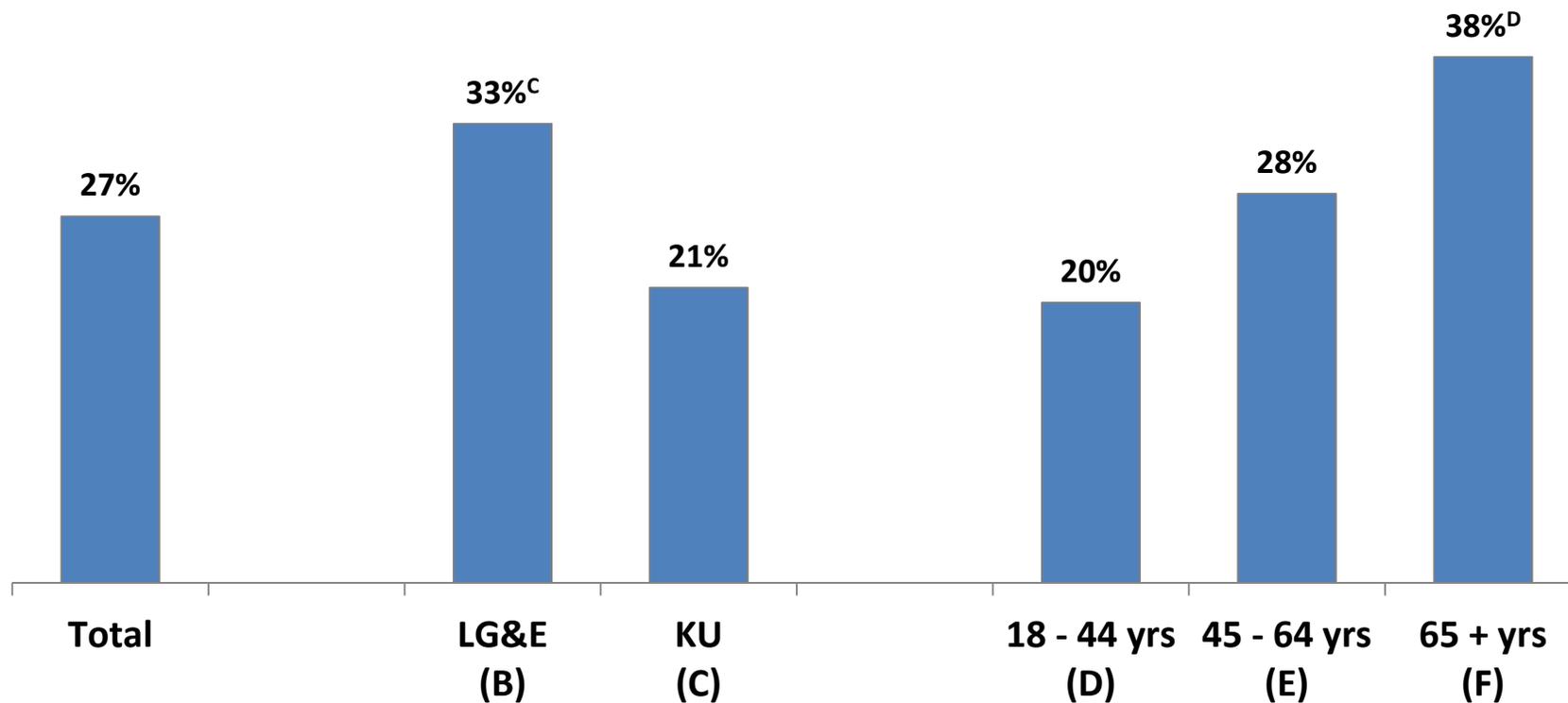


Awareness



Just over one-fourth of LG&E/KU customers are aware of Smart Meter technology, with higher awareness among LG&E customers. Awareness also increases with age.

Smart Meters Awareness - Unaided (% Yes)



Q5: Are you aware of the latest electric meter technology called "Smart Meters"?

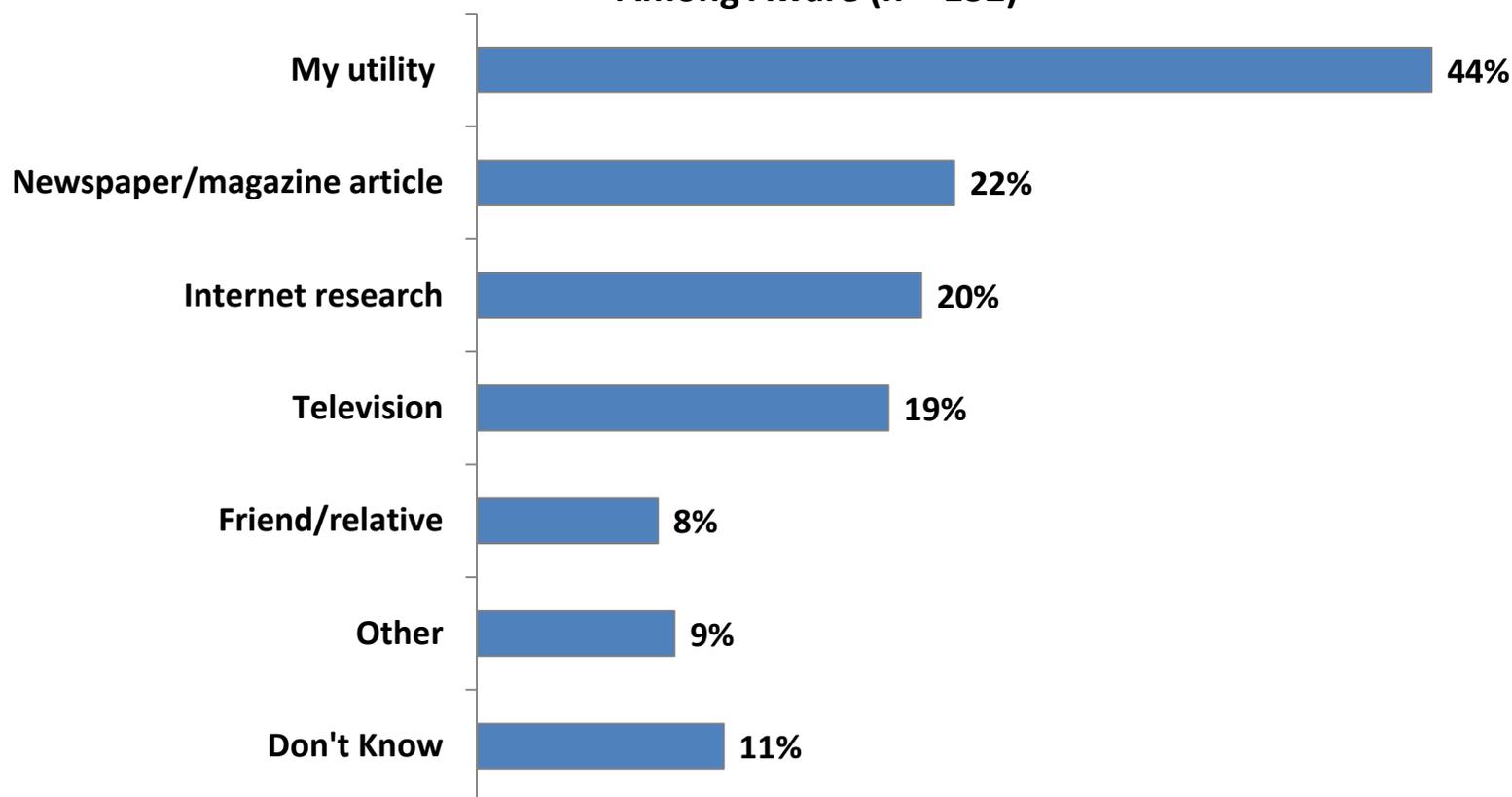


Awareness



Most customers aware of Smart Meters learned about them through their LG&E or KU utility. Newspapers, magazines, internet and television were also good sources for educating customers.

**How Learned About Smart Meters
Among Aware (n = 132)**



Q6: How did you learn about Smart Meters? Select all that apply.

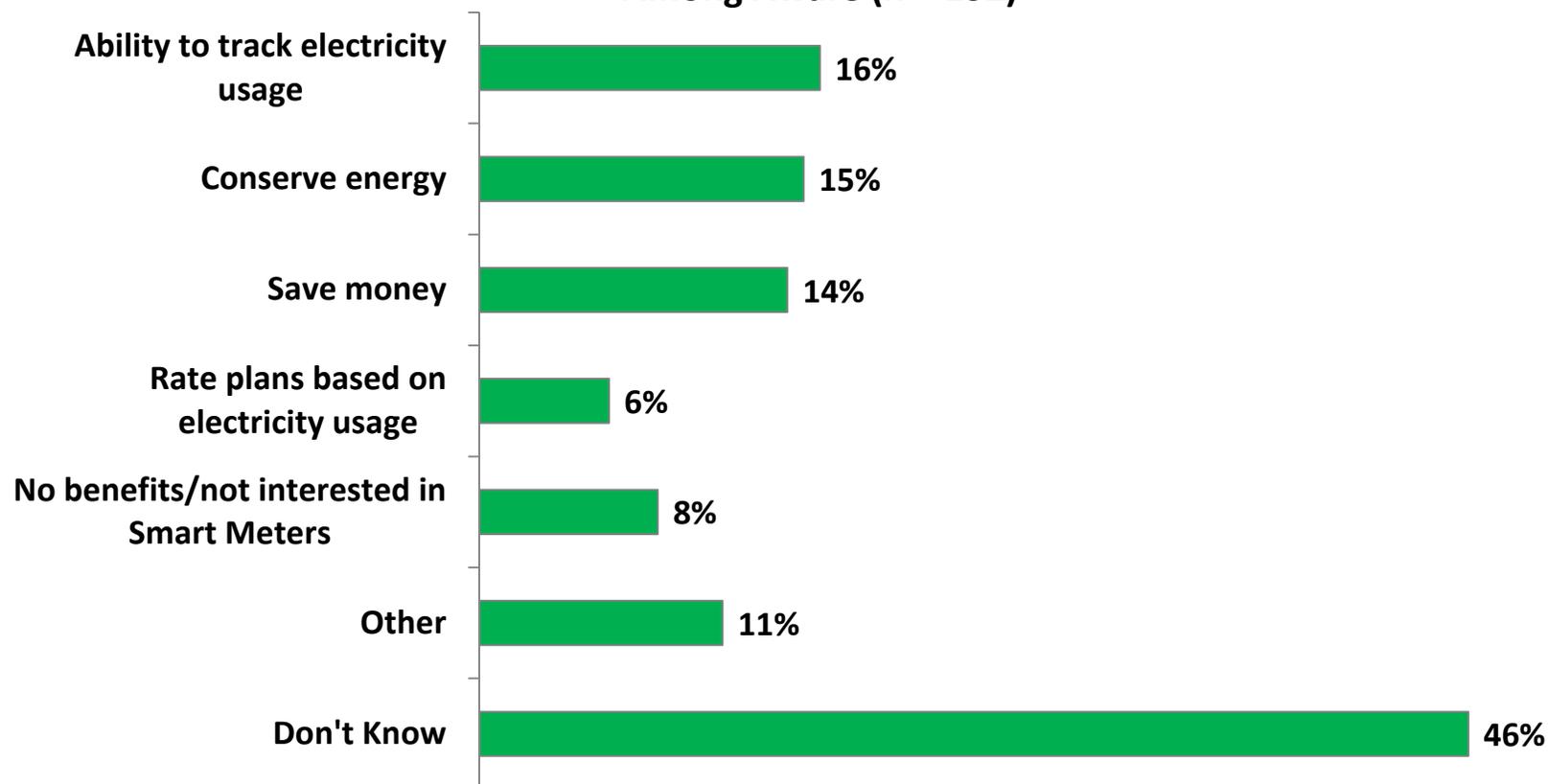


Benefits



Nearly half of customers aware of Smart Meters were not able to explain the benefits of the technology. Those who could noted benefits such as the ability to track usage, conserve energy and save money.

**Perceived Benefits/Advantages of Smart Meters
Among Aware (n = 132)**



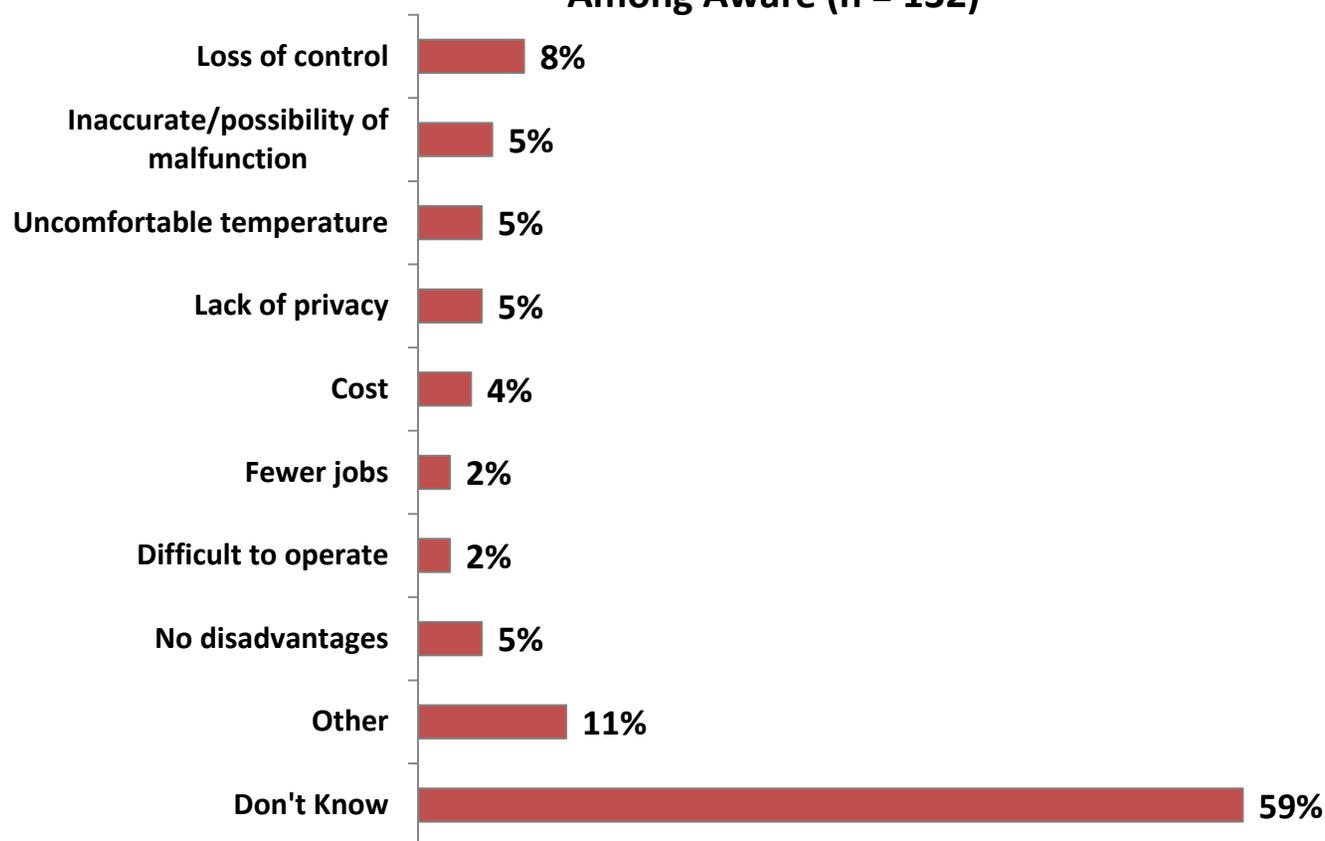


Disadvantages



The majority of customers aware of Smart Meters don't know what the disadvantages are. Other customers were concerned with loss of control, system malfunctions, uncomfortable temperatures and lack of privacy.

Perceived Disadvantages of Smart Meters Among Aware (n = 132)



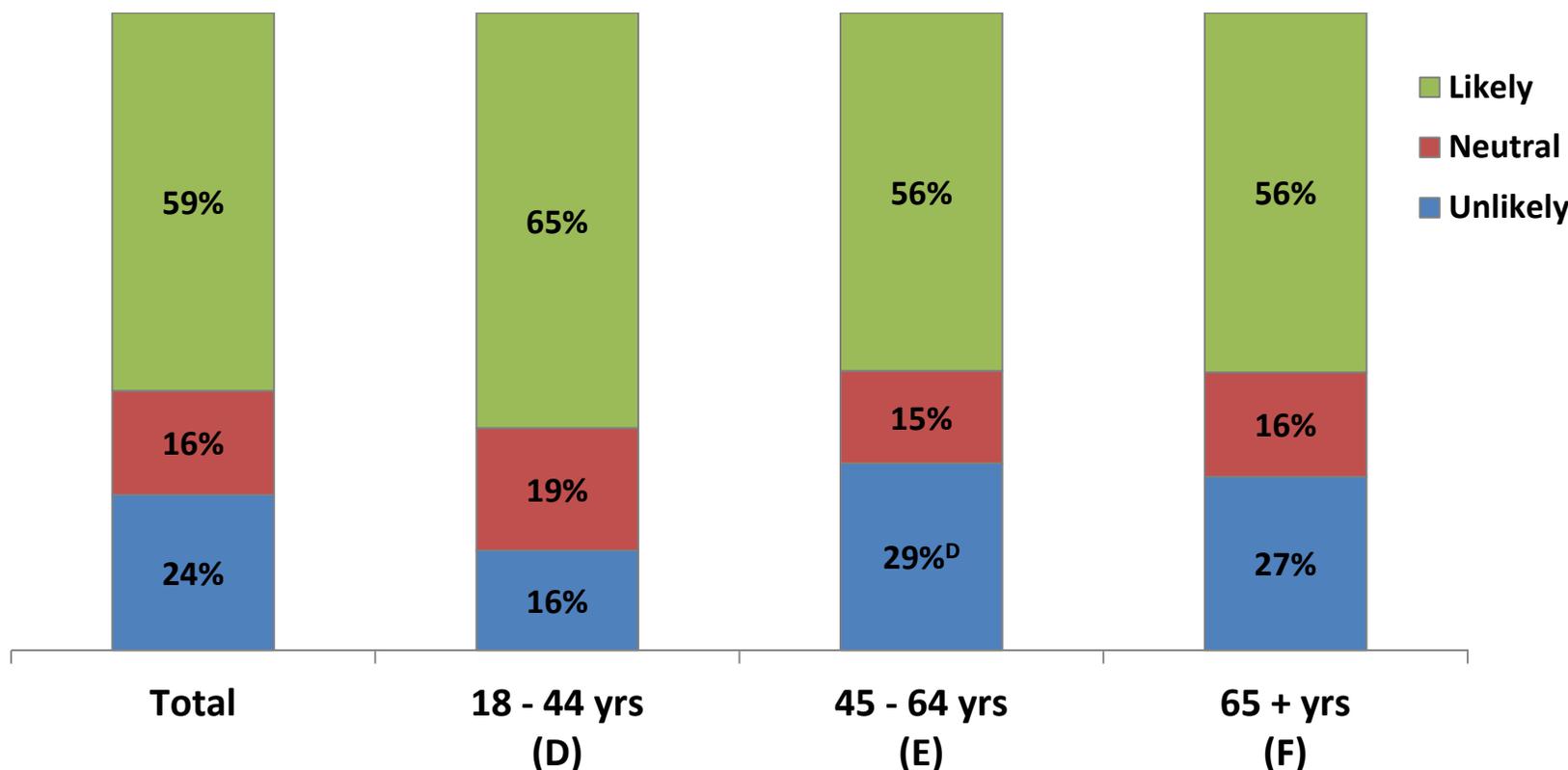


Likelihood to Participate



Following a brief description of Smart Meters, over half of LG&E/KU customers responded that they were likely to participate if the utility offered a program. Likelihood to participate was lower among customers 45+ years, with over one-fourth not likely to participate.

Smart Meters Likelihood to Participate - Aided



Q8: Based on what you currently know about Smart Meters, how likely would you be to participate in a Smart Meter program if one was offered by [LG&E, Kentucky Utilities]? (5pt scale)



Rate Options



Take Rate is highest for the Peak Time Rebate rate option and significantly ahead of the other three options. Inclining Block was the least favorable rate option.

Smart Meters Rate Options

	Time of Use (A)	Critical Peak (B)	Peak Time Rebate (C)	Inclining Block (D)
Likelihood to Participate (T2B)	55.2% ^{BD}	48.6% ^D	70.4% ^{ABD}	37.9%
Ease of Understanding (T2B)	76.4% ^{BD}	72.0% ^D	74.2% ^D	60.5%
Ease of Making Usage Changes (T2B)	52.8% ^{BD}	48.2% ^D	64.1% ^{ABD}	36.5%
Motivation to Lower Usage/Save Money (T2B)	59.1% ^{BD}	54.0% ^D	72.4% ^{ABD}	43.4%
Take Rate*	42.9% ^{BD}	37.7% ^D	55.0% ^{ABD}	25.4%

Q9a: How likely would you be to participate in the [INSERT OPTION] Smart Meter program? (5pt scale)

Q9b: How easy is it to understand the [INSERT OPTION] Smart Meter program? (5pt scale)

Q9c: How easy would it be to make changes to your energy usage with the [INSERT OPTION] Smart Meter program? (5pt scale)

Q9d: How motivated would you be to lower your energy usage and save money with the [INSERT OPTION] Smart Meter program? (5pt scale)

*Take Rate Definition: Customers rating all four metrics T2B (likelihood to participate, ease of understanding, ease of making changes, motivation)



Rate Options



Peak Time Rebate had the highest Take Rate among both LG&E and KU customers. In general, Take Rates were lower among KU customers.

Smart Meters Rate Options – LG&E vs KU

Take Rate*	Time of Use (A)	Critical Peak (B)	Peak Time Rebate (C)	Inclining Block (D)
Total LG&E/KU	42.9% ^{BD}	37.7% ^D	55.0% ^{ABD}	25.4%
LG&E	48.1% ^D	42.1% ^D	57.9% ^{ABD}	26.4%
KU	38.9% ^D	34.3% ^D	52.9% ^{ABD}	24.6%

*Take Rate Definition: Customers rating all four metrics T2B (likelihood to participate, ease of understanding, ease of making changes, motivation)



Rate Options



Take Rate is highest for the Peak Time Rebate rate option among both the 18-44 and 45-64 year old groups. However, for older customers Take Rates were comparable for Peak Time Rebate and Time of Use.

Smart Meters Rate Options – By Age Group

Take Rate*	Time of Use (A)	Critical Peak (B)	Peak Time Rebate (C)	Inclining Block (D)
Total LG&E/KU	42.9% ^{BD}	37.7% ^D	55.0% ^{ABD}	25.4%
Age 18-44	42.3% ^D	36.6% ^D	55.2% ^{ABD}	25.5%
Age 45-64	41.6% ^D	37.2% ^D	55.0% ^{ABD}	24.2%
Age 65+	51.0% ^D	43.7%	54.6% ^D	30.7%

*Take Rate Definition: Customers rating all four metrics T2B (likelihood to participate, ease of understanding, ease of making changes, motivation)



Tools and Features



The features most preferred by customers were tracking electricity usage on an in-home display/energy monitor or on-line. Smartphone features were least preferred overall, but were more preferred among younger customers over Email (coincides with Smartphone ownership).

MaxDiff Preference Score

Smart Meter Features	Total LG&E/KU (n = 495)	Age 18-44 (n = 172)	Age 45-64 (n = 268)	Age 65+ (n = 55)
Track your electricity usage on an in-home display or energy monitor	20.18	18.09	21.37	20.91
Track your electricity usage on-line	16.96	16.35	17.16	17.92
Receive Email alerts about when higher rates would start to apply	13.16	10.35	13.89	18.36
Ability to adjust your thermostat on-line	10.89	9.43	12.06	9.82
Receive Email alerts about your electricity usage	10.79	7.11	12.16	15.63
Ability to adjust your thermostat using a Smartphone app	9.94	12.81	8.71	6.93
Track your electricity usage using a Smartphone app	9.19	14.07	7.02	4.45
Receive text message alerts on your Smartphone about when higher rates would start to apply	8.89	11.78	7.63	5.97

Q10: Of the tools or features listed, please choose which one is the Most Important and which is the Least Important to your participation in a Smart Meter program.

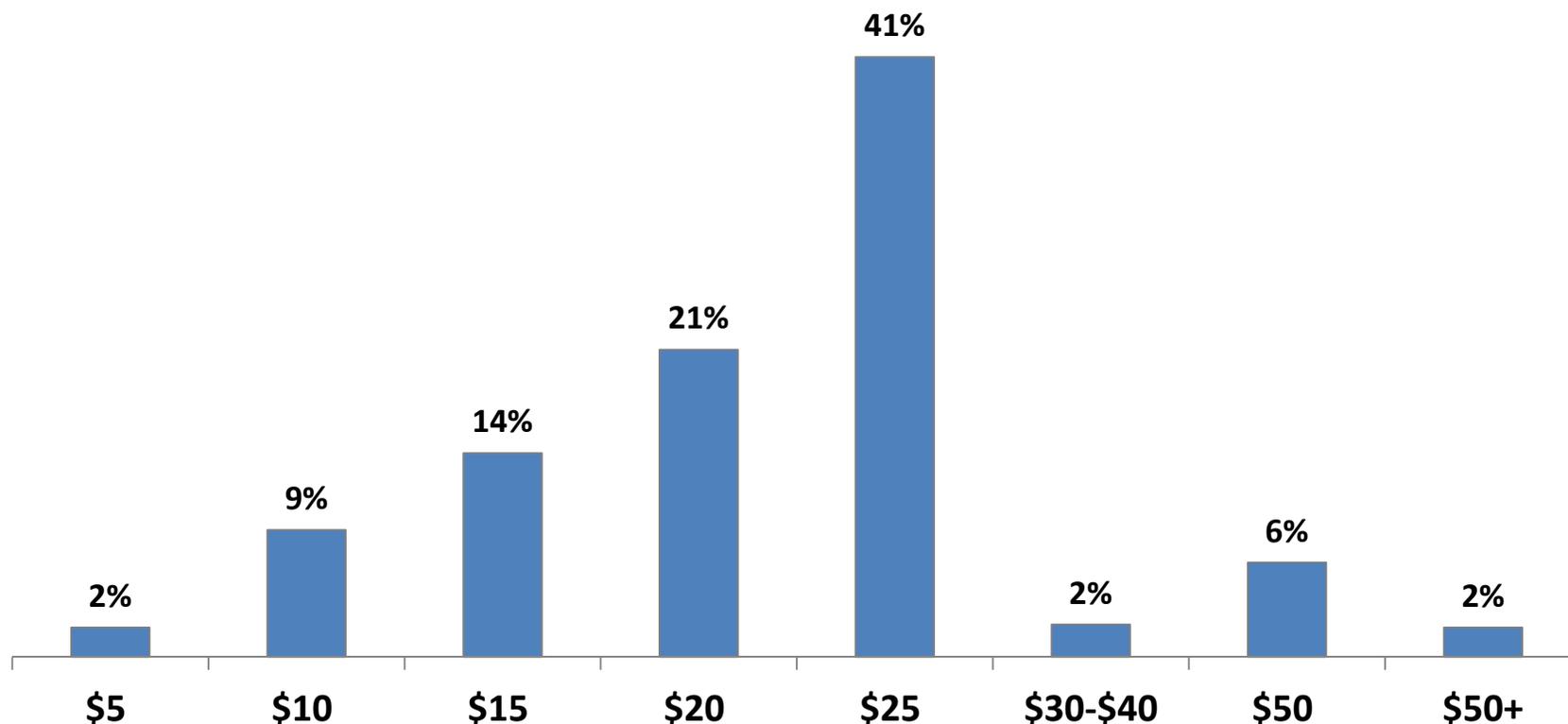


Monthly Savings



In order to drive a change in behavior, 41% of customers want to save \$25 a month. However, another 46% would be willing to save \$20 or less a month.

Monthly Savings Desired to Change Behavior



Q11: How much would you need to save on your monthly electric bill in order to change your behavior, such as adjusting your thermostat to sometimes less-comfortable settings, changing the time of day you use appliances, etc.?

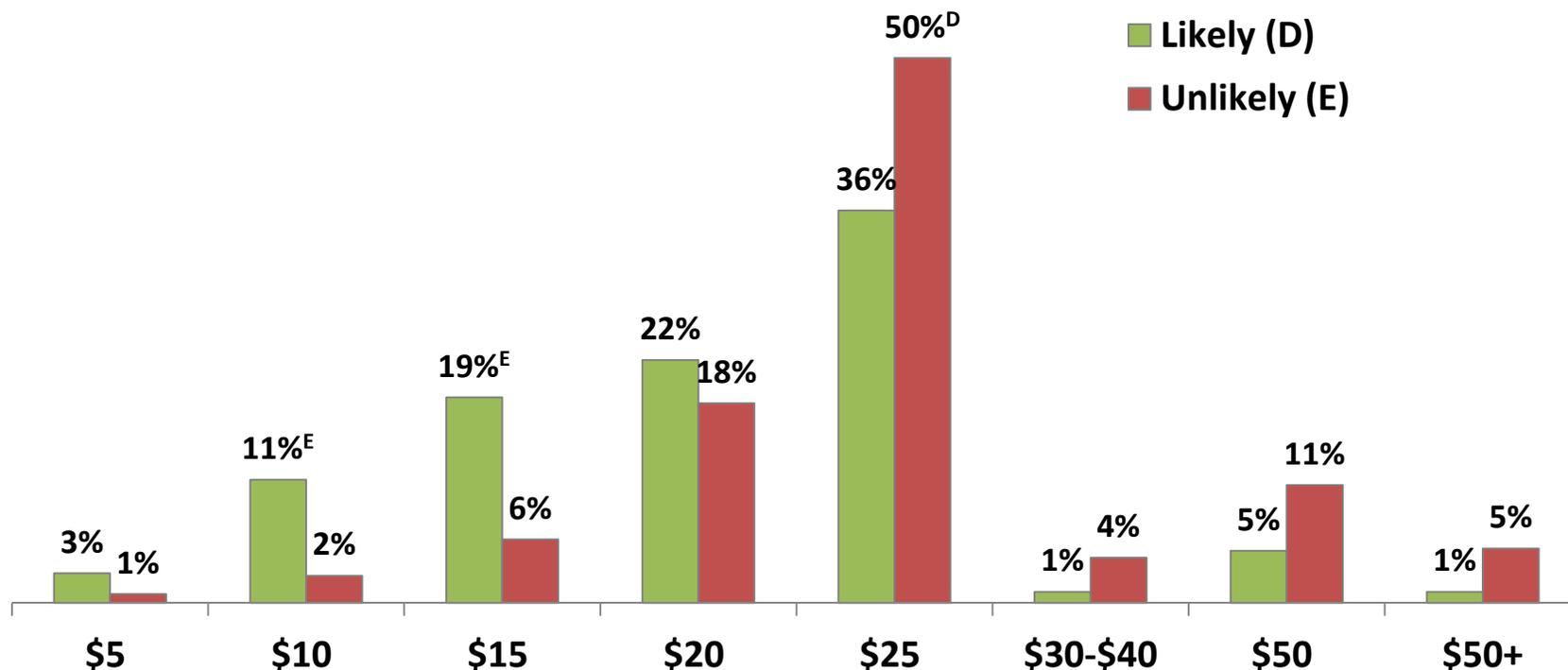


Monthly Savings



Customers stating they are unlikely to participate in a Smart Meter program require higher savings in order to motivate them to change their behavior than those likely to participate.

Monthly Savings Desired to Change Behavior Likely vs Unlikely to Participate*



Q11: How much would you need to save on your monthly electric bill in order to change your behavior, such as adjusting your thermostat to sometimes less-comfortable settings, changing the time of day you use appliances, etc.?

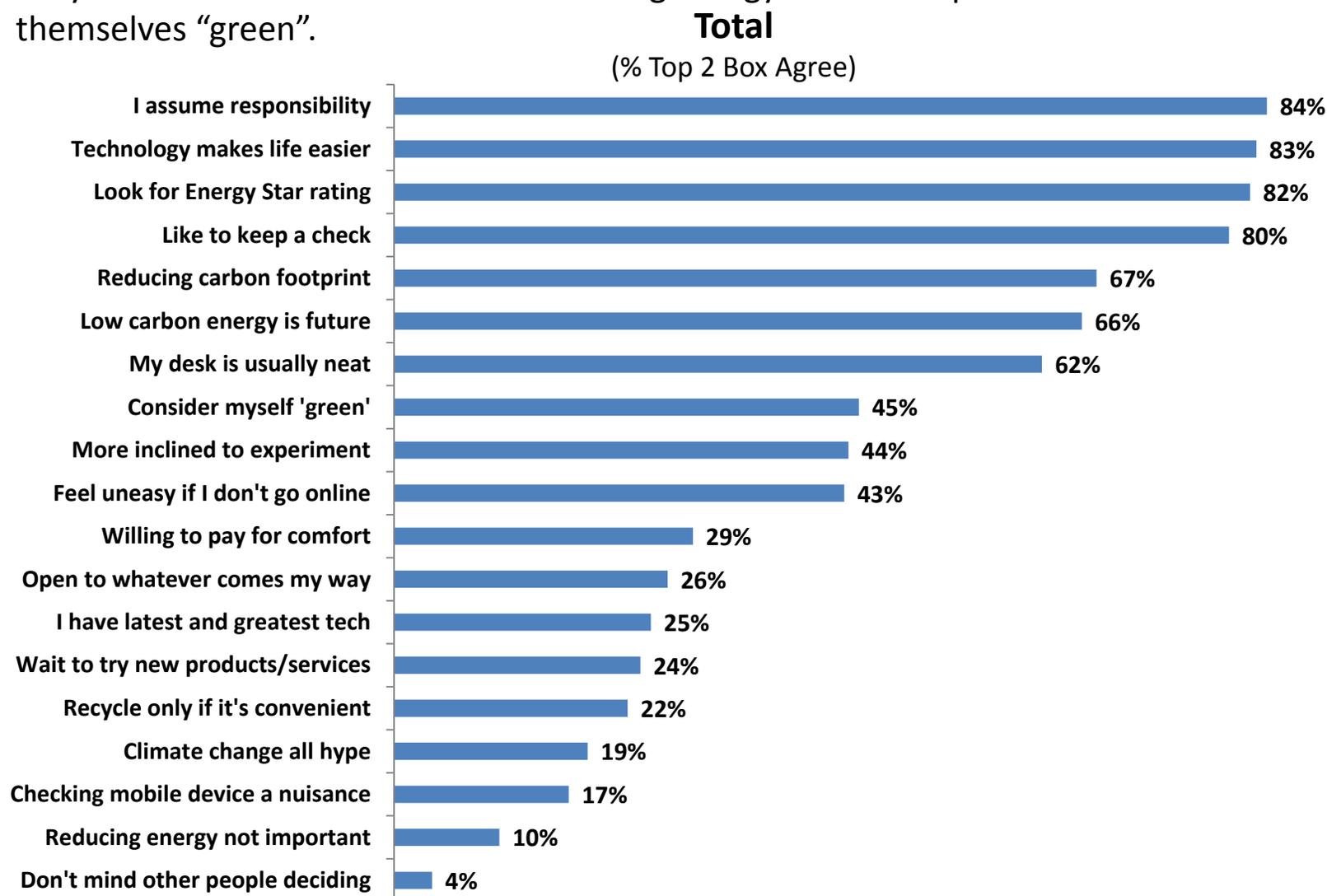
*Q8: Based on what you currently know about Smart Meters, how likely would you be to participate in a Smart Meter program if one was offered by [LG&E, Kentucky Utilities]? (5pt scale)



Attitudes



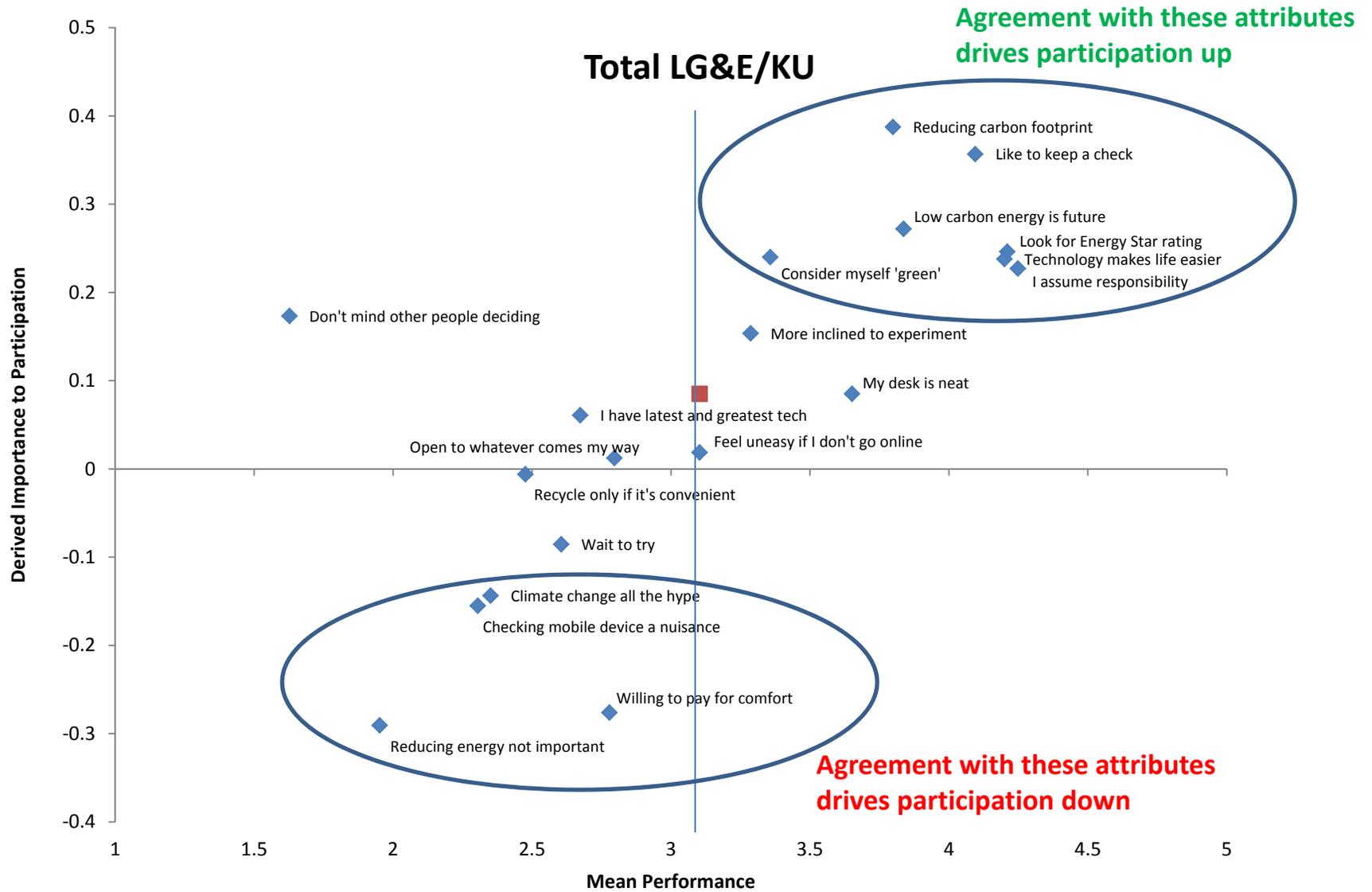
Only one in 10 customers felt that reducing energy was not important. Less than half consider themselves “green”.



Q12: How much do you agree or disagree with each of the following statements? (5pt scale)



Attitudes and Participation



Q12: How much do you agree or disagree with each of the following statements? (5pt scale)



Thermostat Adjustment

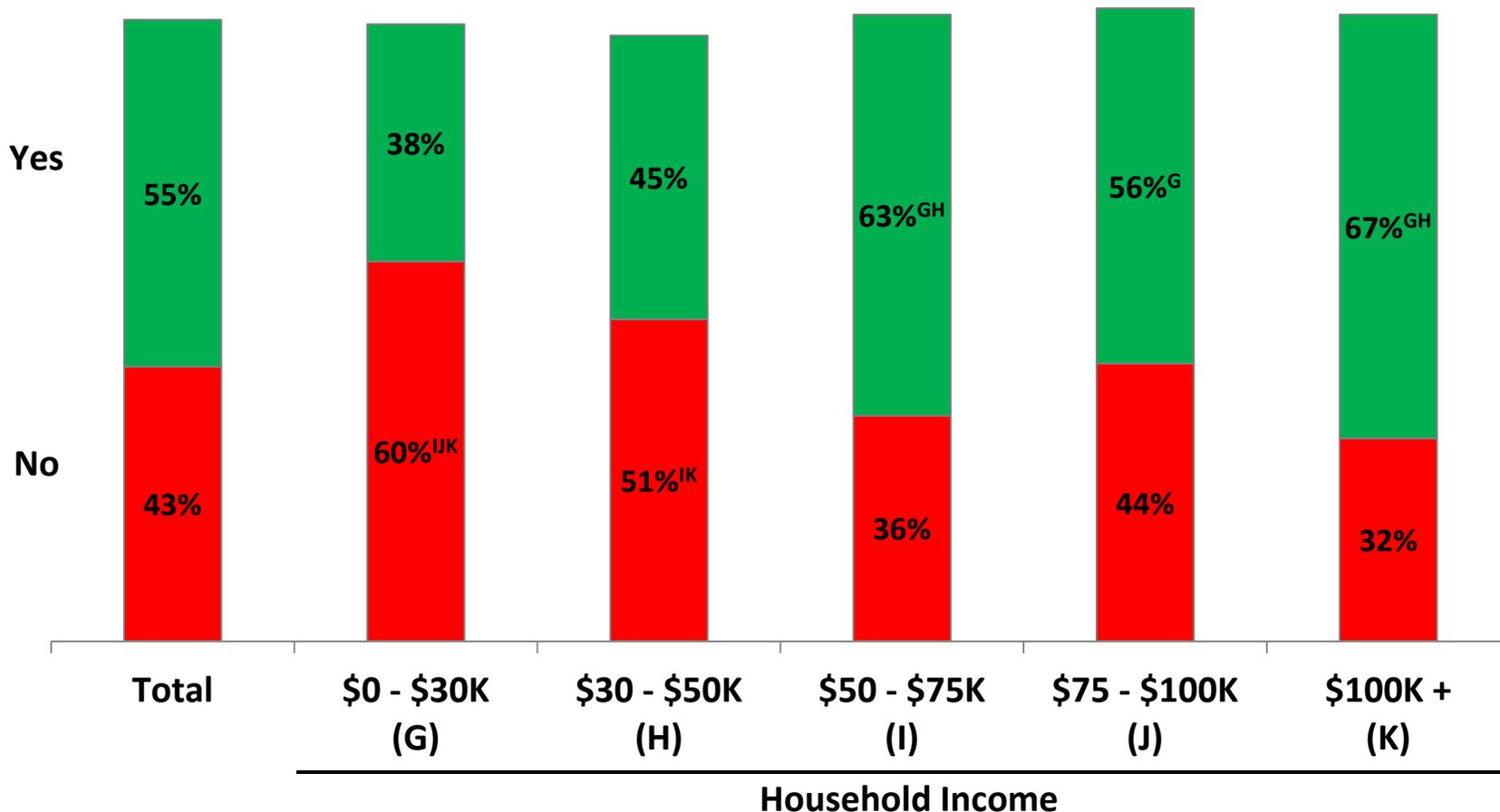


Programmable Thermostat



Just over half of all customers have a programmable thermostat in their home. Significantly fewer low income households have a programmable thermostat.

Programmable Thermostat in Residence



Q4: Is the thermostat in your residence programmable?

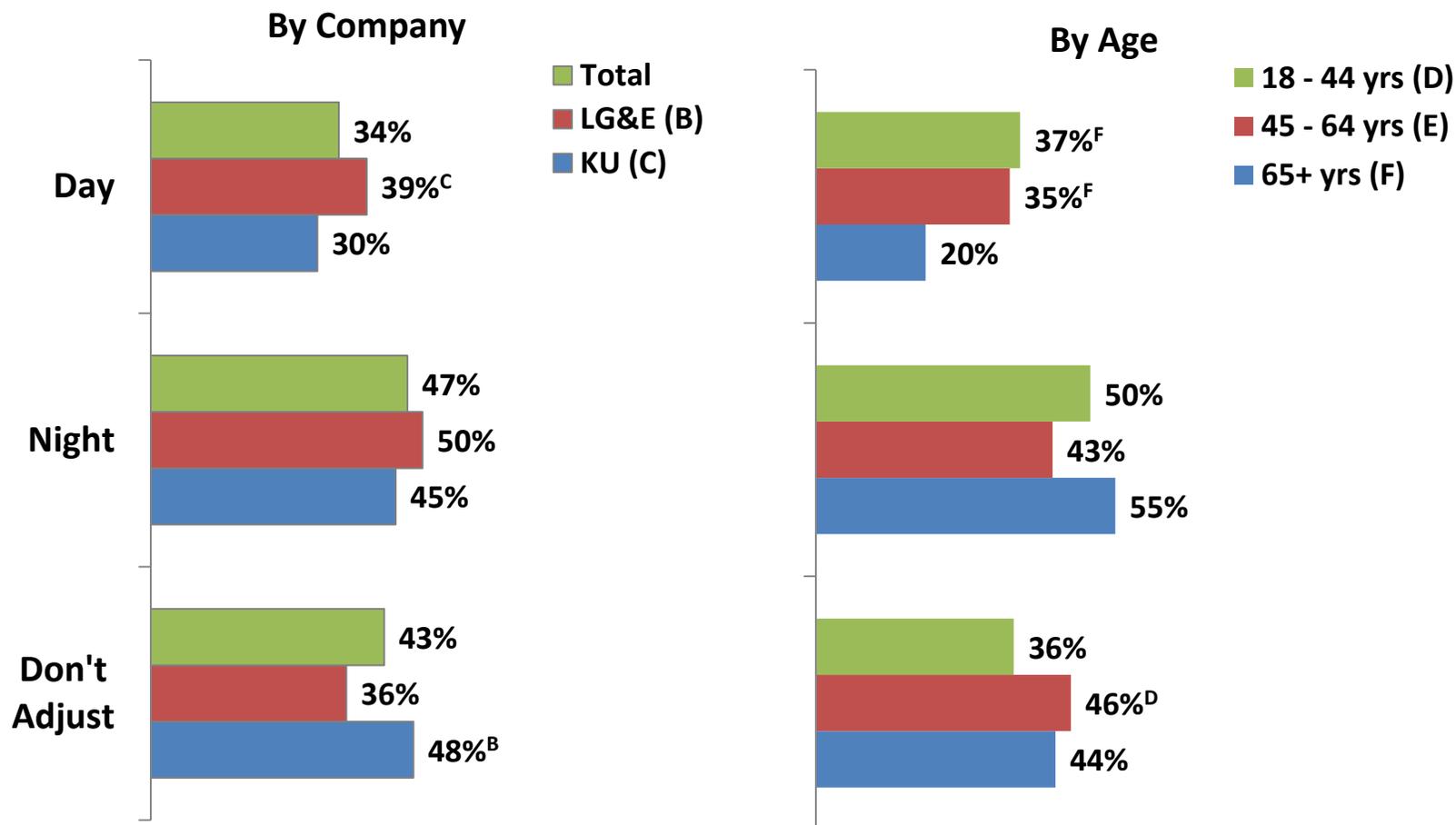


Thermostat Adjustment



In general, about one-third of customers adjust their thermostat during the day (fewer if 65+ years old) and half adjust at night. Significantly more KU customers don't adjust their thermostat at all.

When Adjust Thermostat on Weekdays



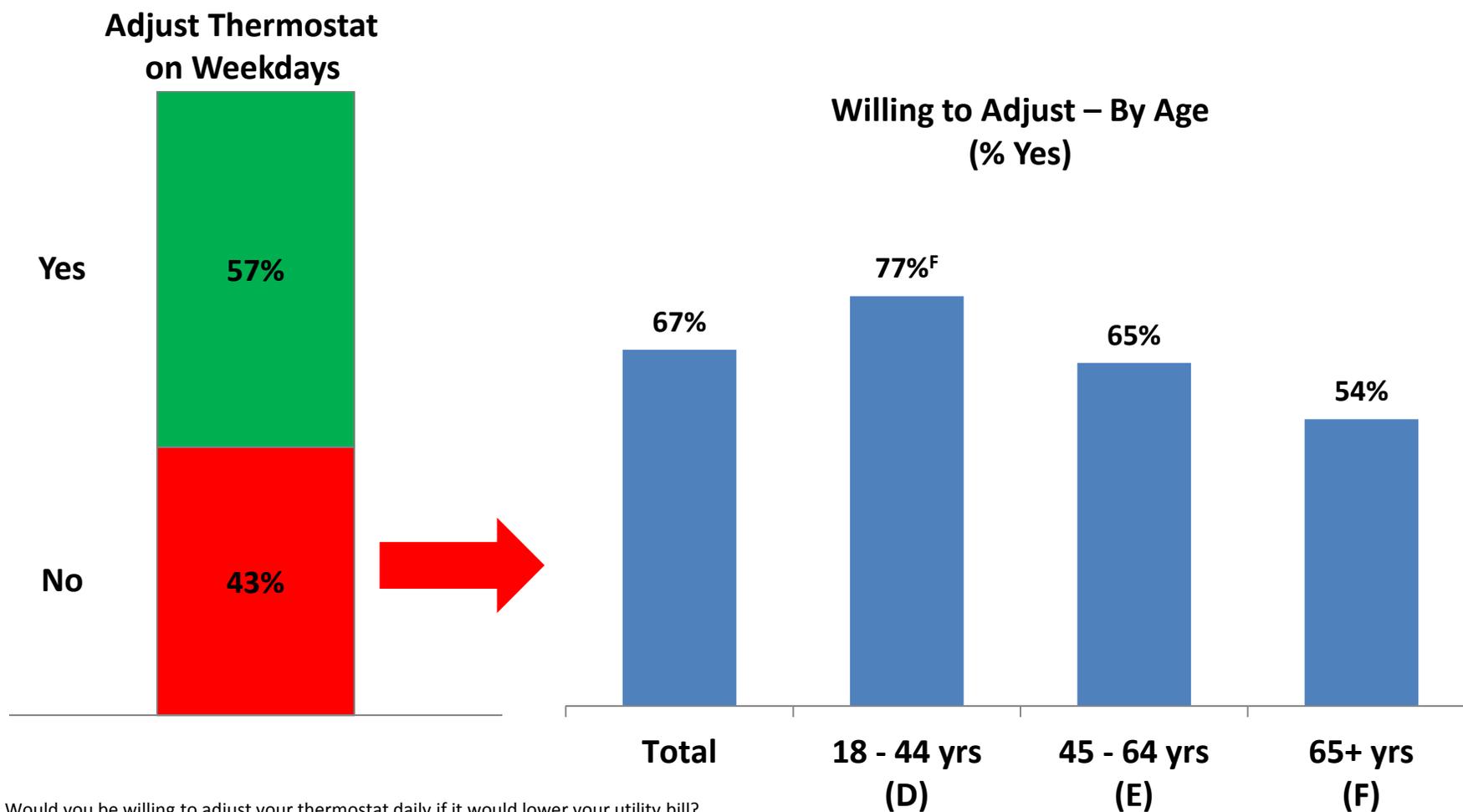
Q2: Thinking about the weekdays (Monday through Friday), when do you or others in your household usually adjust your thermostat (either manually or programmed), if at all? Select all that apply.



Thermostat Adjustment



Nearly two in five customers currently do not adjust their thermostat, however two-thirds reported they would be willing to adjust if it would lower their utility bill. Willingness to adjust declines as age increases.



Q3: Would you be willing to adjust your thermostat daily if it would lower your utility bill?

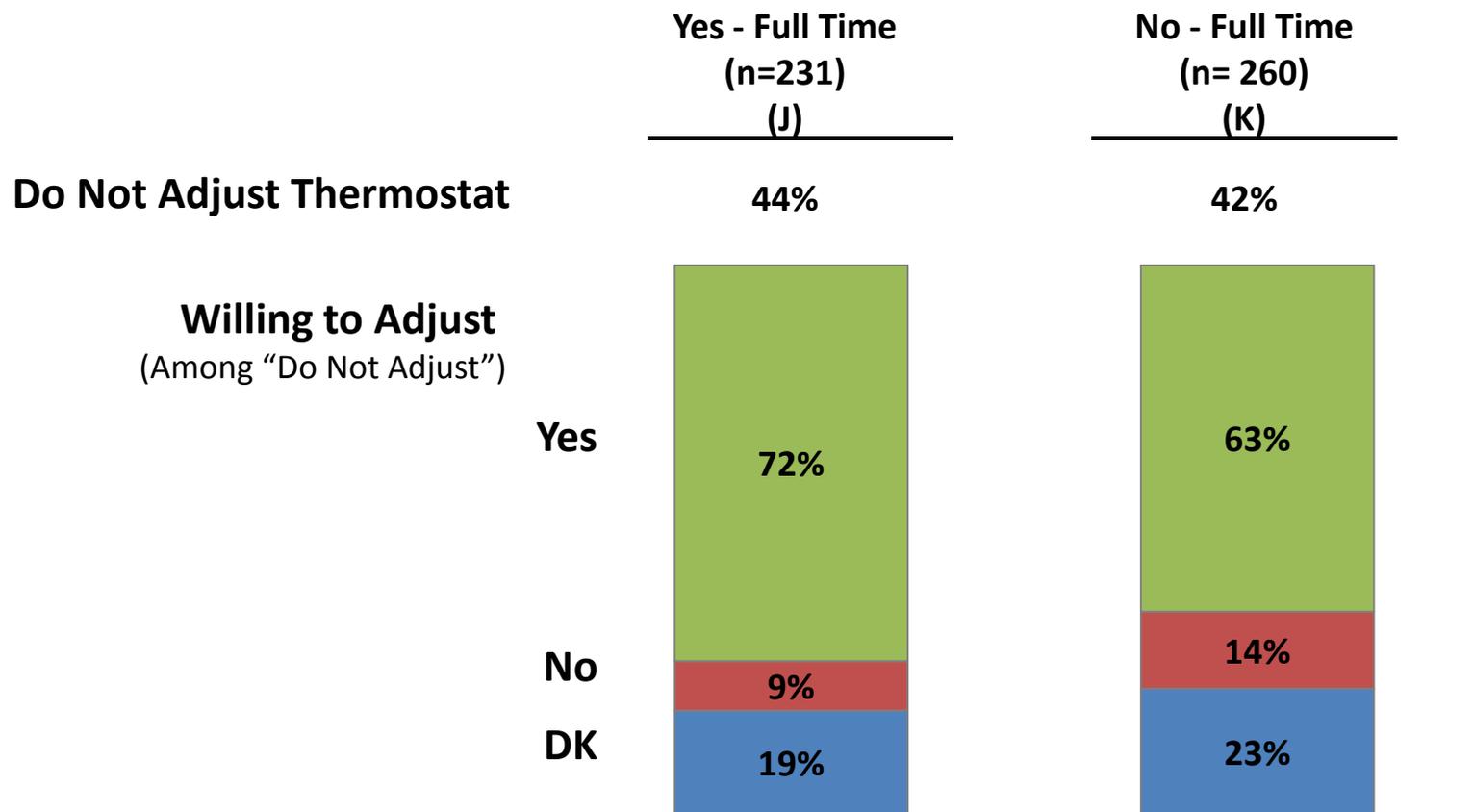


Thermostat Adjustment



Just under half of households where all adults work full time outside of the home do not adjust their thermostat, comparable to non-full time households. However, full time working households are more willing to adjust if it will save them money on their bill.

Thermostat Adjustment - All Adults Employed Full Time



Q3: Would you be willing to adjust your thermostat daily if it would lower your utility bill?

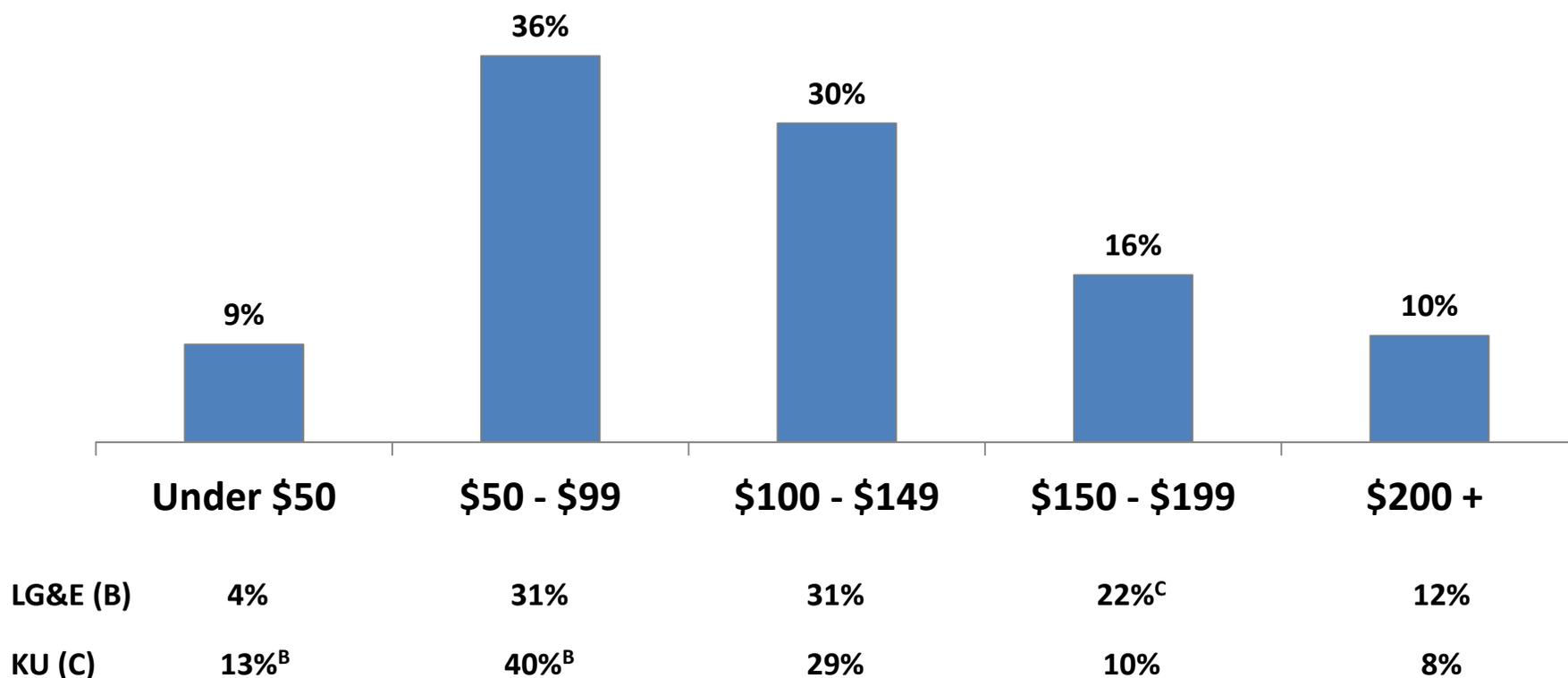


Utility Bill



Two-thirds of customers reported that their most recent utility bill was between \$50 to \$150. Bills for LG&E customers skewed higher than KU.

**Most Recent Utility Bill
(% of LG&E/KU Customers)**



QS4a: Approximately, how much was your most recent [LG&E or Kentucky Utilities] bill (excluding any past due amounts)? Please round to the nearest whole dollar.



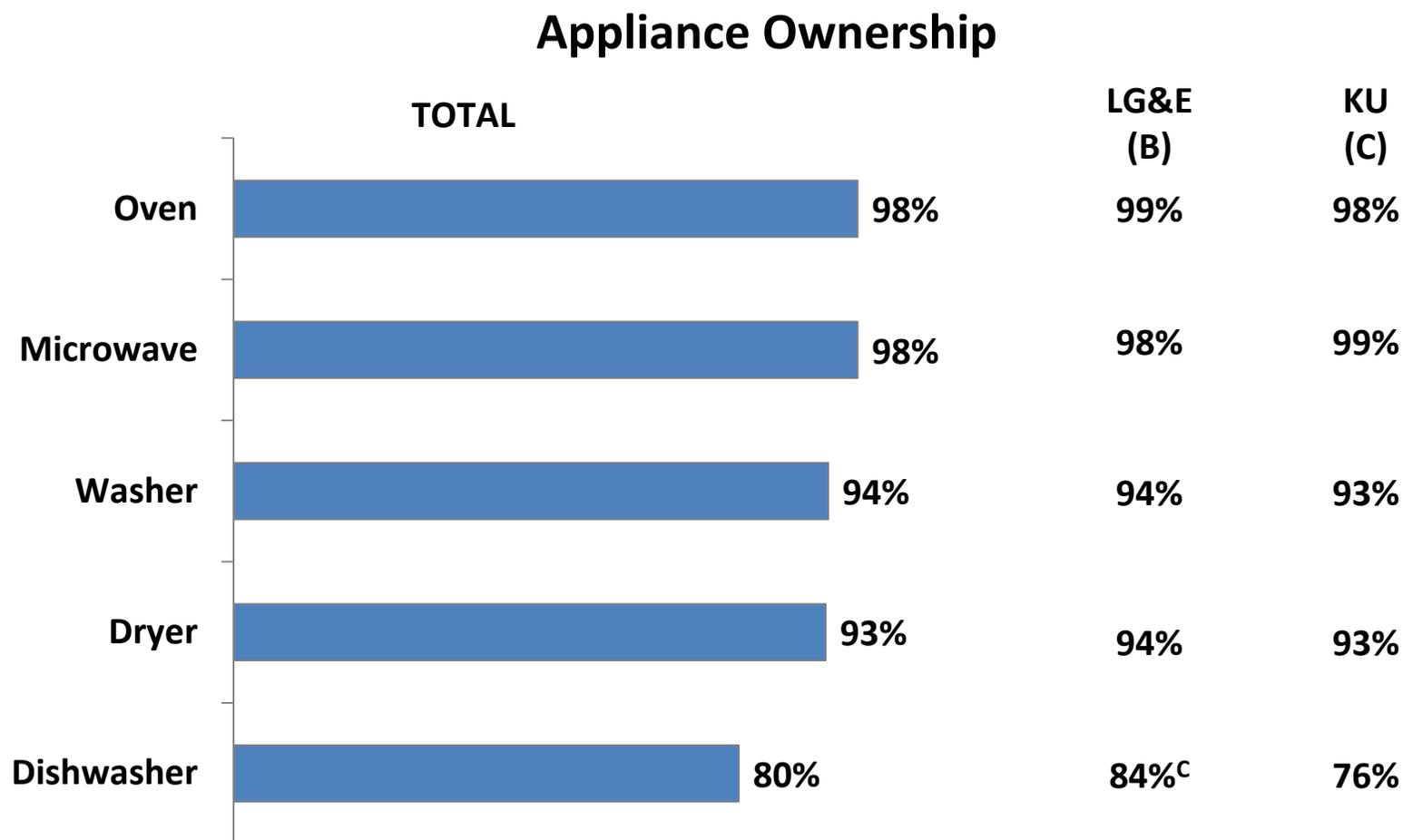
Appliance Usage



Appliance Ownership



Nearly all customers own an oven and/or microwave, while 4 in five customers owns a dishwasher. Significantly more LG&E customers own a dishwasher than KU.



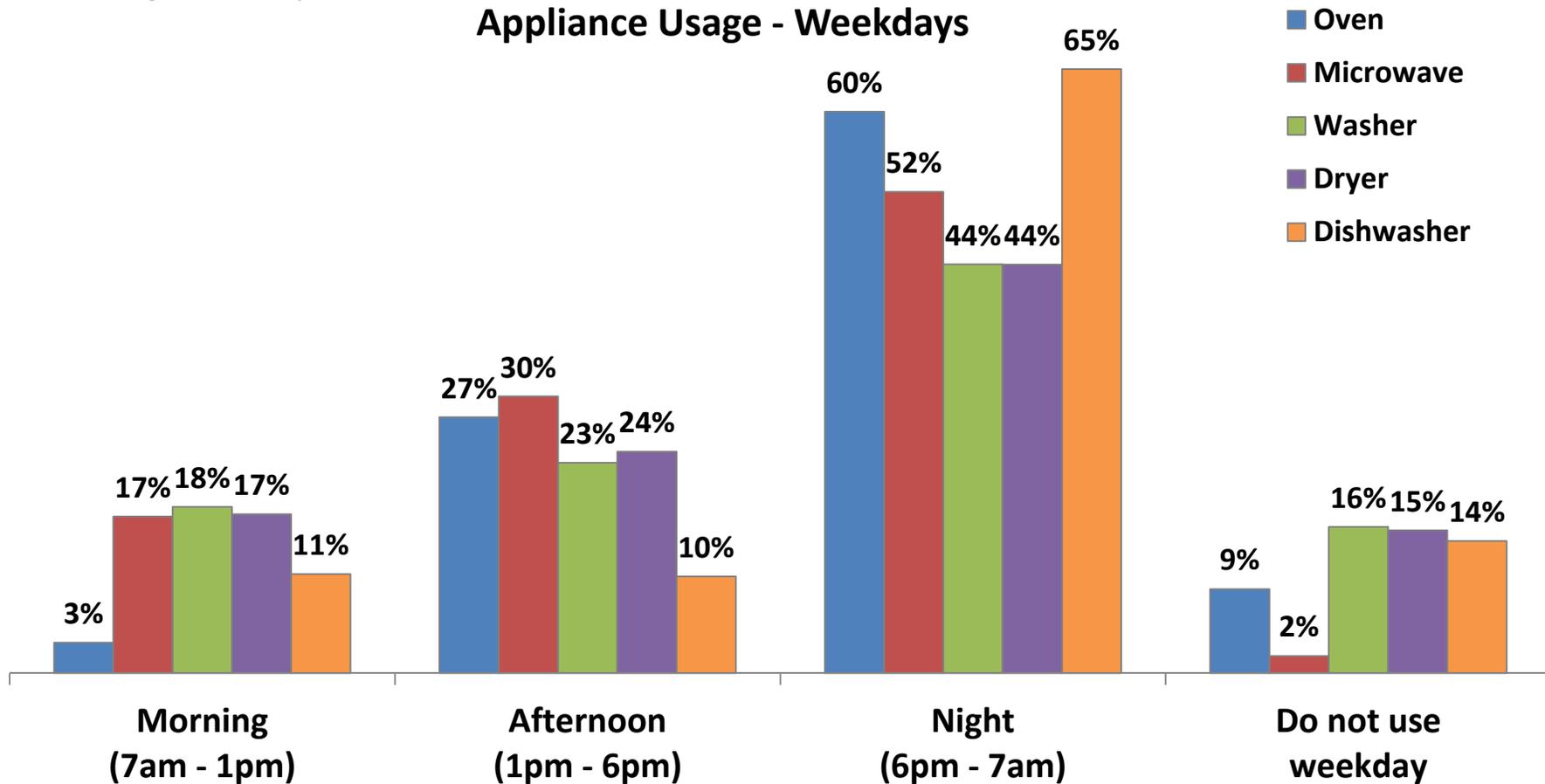
Q1: Which of the following appliances do you have in your residence?



Appliance Usage



During weekdays, all appliances are used most heavily after 6pm, particularly the dishwasher and oven. On average, about 15% of customers don't use their washer, dryer or dishwasher at all during weekdays.



Q1a: When do you most often use your appliances during the weekdays?

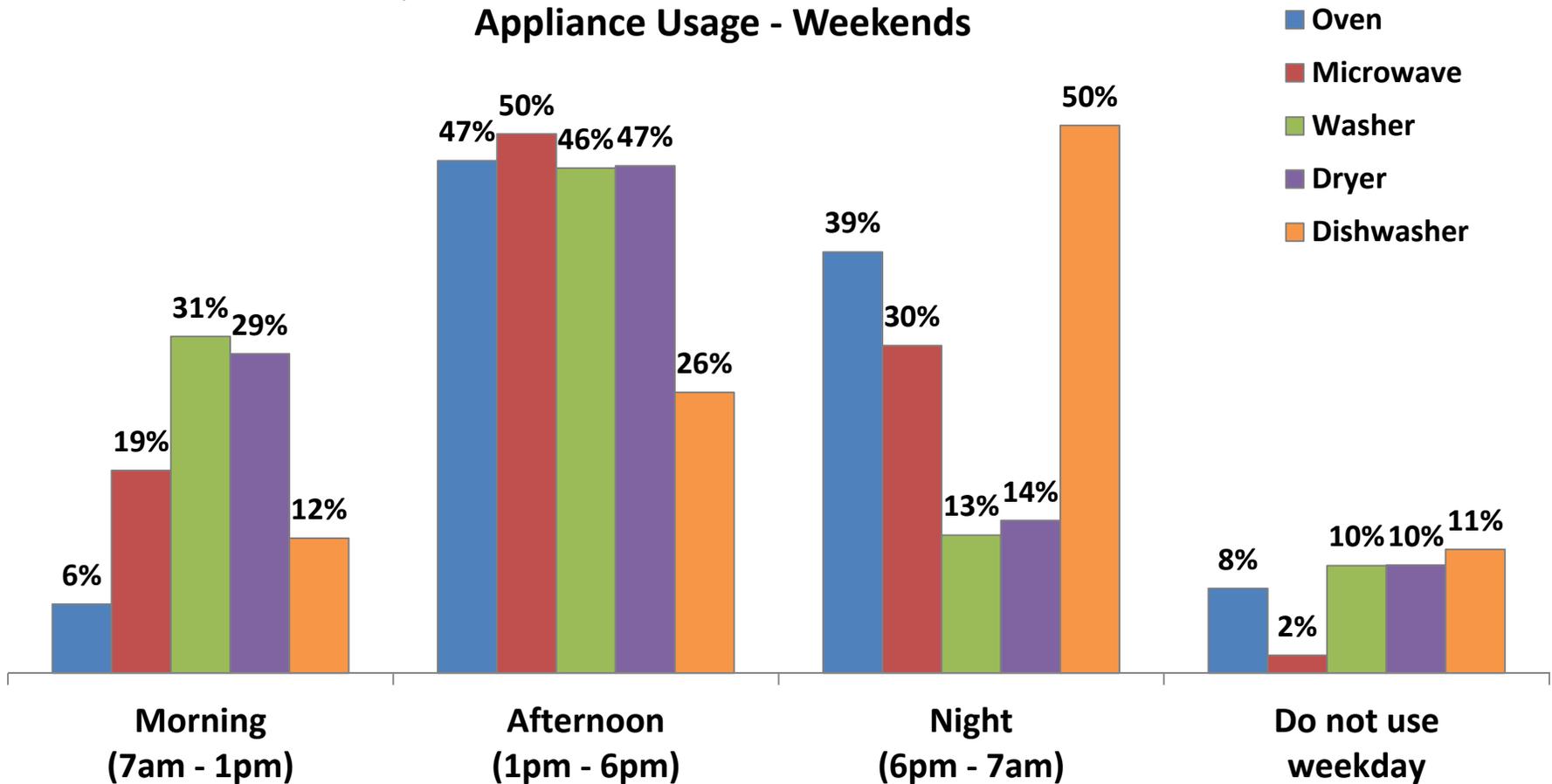


Appliance Usage



On the weekends, usage spikes in the afternoon for all appliances, except the dishwasher which half of customers still use at night. Washer and dryer usage increases in the morning on the weekend versus weekdays.

Appliance Usage - Weekends



Q1b: When do you most often use your appliances on the weekend?



Appliance Usage



During the week, appliance usage is heaviest at night for younger households (18-64 years), but tends to shift to the afternoon on weekends.

Appliance Usage by Age Group (% of Respondents)

	Washer			Dryer			Oven			Dishwasher			Microwave		
Weekdays	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)
Morning (7am-1pm)	9	16 ^D	54 ^{DE}	8	17 ^D	48 ^{DE}	2	4	4	5	13 ^D	13	10	20 ^D	22
Afternoon (1pm-6pm)	18	25	28	18	25	34 ^D	22	28	42 ^D	11	9	17	28	28	42
Night (6pm-7am)	56 ^{EF}	42 ^F	14	56 ^{EF}	42 ^F	14	72 ^{EF}	57 ^F	38	71	63	57	60 ^F	50 ^F	35
Do Not Use Weekday	18 ^F	16 ^F	4	18 ^F	16 ^F	4	4	11 ^D	16 ^D	14	15	13	2	2	2
Weekends	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)	18-44 (D)	45-64 (E)	65+ (F)
Morning (7am-1pm)	27	33	32	26	31	32	5	7	5	12	13	9	9	25 ^D	18
Afternoon (1pm-6pm)	56 ^{EF}	45 ^F	22	56 ^{EF}	46 ^F	20	50	47	38	37 ^{EF}	20	19	60 ^{EF}	45	44
Night (6pm-7am)	15 ^F	13	6	16	14	8	41	36	45	44	55 ^D	49	30	29	36
Do Not Use Weekend	3	9 ^D	40 ^{DE}	3	9 ^D	40 ^{DE}	3	10 ^D	11	8	11	23 ^D	1	2	2

Q1a: When do you most often use your appliances during the weekdays?

Q1b: When do you most often use your appliances on the weekend?



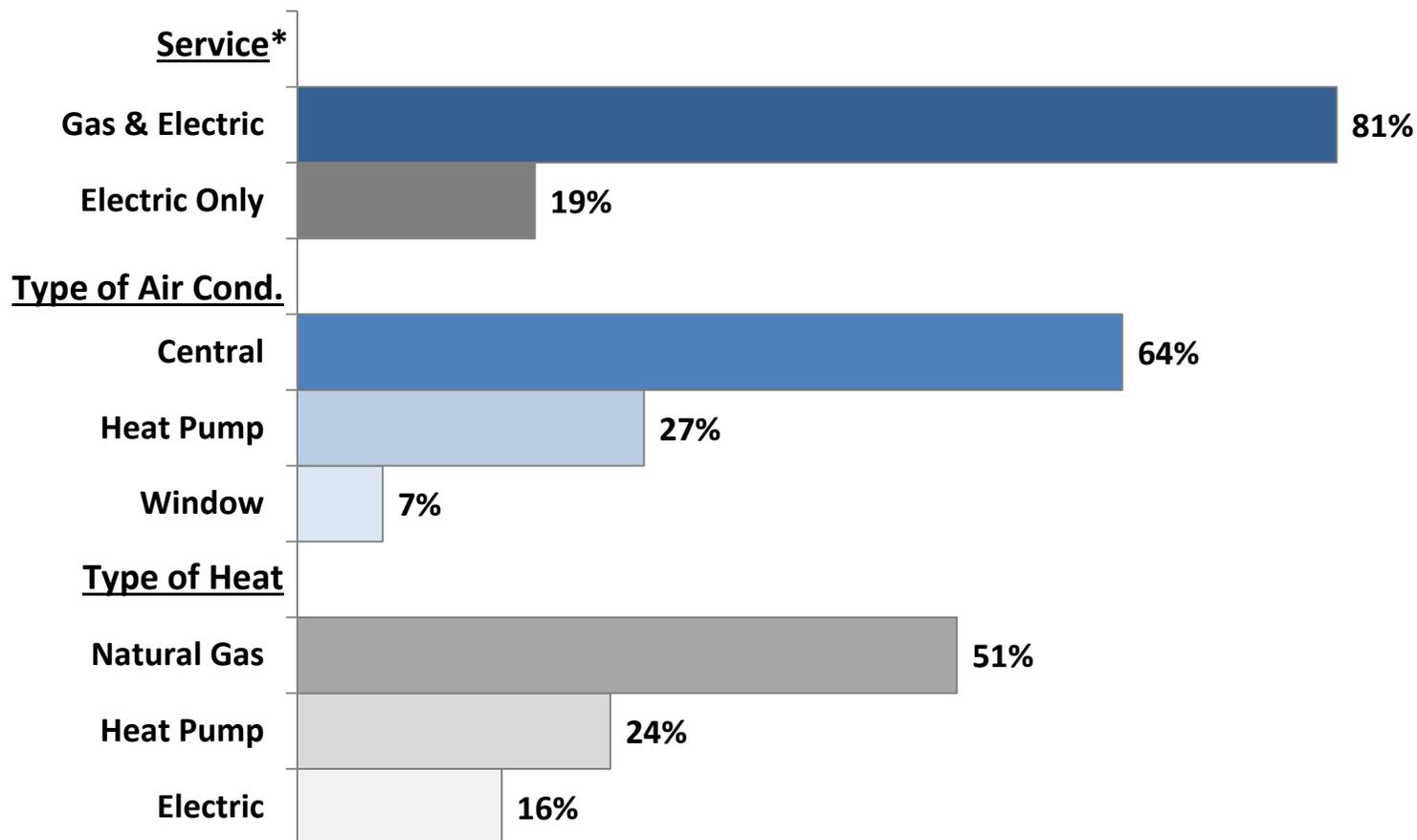
Demographics



Residence Profile



The majority of LG&E customers surveyed have gas and electric service. About two-thirds of all customers have central air conditioning and half use natural gas.



* Asked among LG&E customers only

Q13: Are you an LG&E customer for electric service only, or for both gas and electric service?

Q14: What is the primary type of air conditioning used in your residence, if any?

Q15: What is the primary type of heating used in your residence?



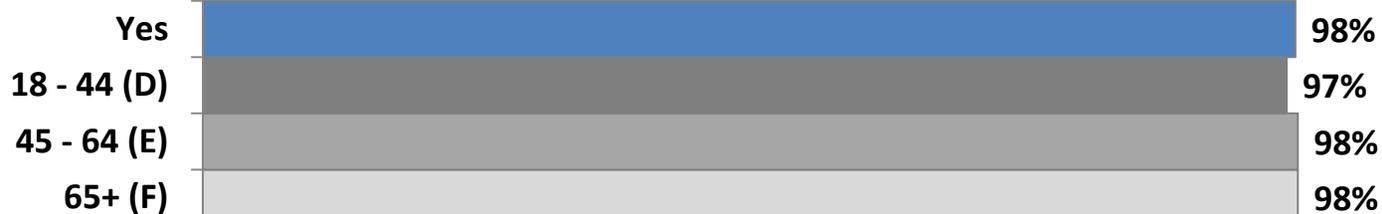
Residence Profile



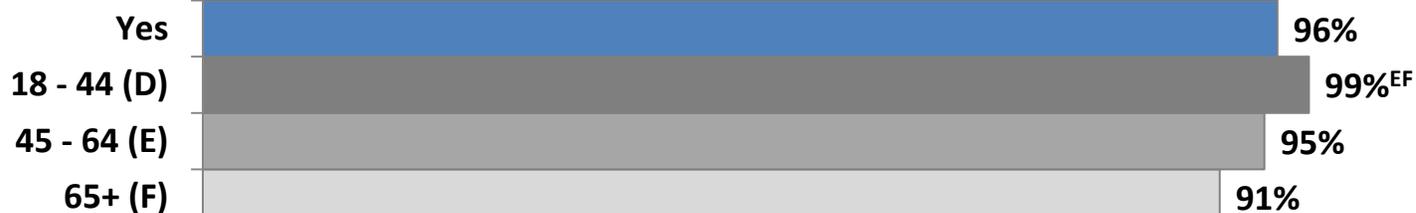
Although most customers own a cell phone, fewer than two-thirds own a Smartphone and ownership is significantly lower among older age groups. High internet access is a function of this being an internet study.

Access to Internet

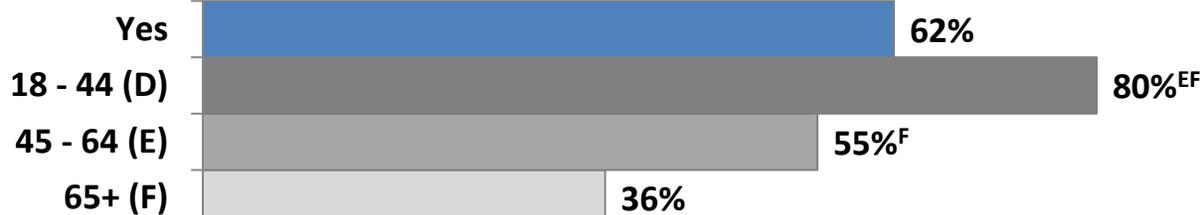
at Residence



Own Cell Phone



Smartphone*



* Asked among "Yes" to Q17 - Own a Cell Phone?

Q16: Do you have access to the internet at your residence?

Q17: Do you own a cell phone?

Q18: Is your cell phone a Smartphone? That is, a phone that allows you to download and run applications or apps, and includes other advanced features.



Demographic Profile



Education		Number of Children Under 18		Income	
1 st through 8 th grade	0.4%	0	66.7%	Under \$10,000	2.2%
Some high school	0.6%	1	12.5%	\$10,000 - \$20,000	6.7%
High school grad or equivalent	8.1%	2	11.1%	Over \$20,000 - \$30,000	7.3%
Some college or technical school	30.7%	3 or more	7.1%	Over \$30,000 - \$40,000	9.9%
College graduate	32.7%	Prefer not to answer	2.6%	Over \$40,000 - \$50,000	13.5%
Grad/post-grad school	26.6%	Employed Full-Time Outside Home		Over \$50,000 - \$75,000	20.4%
Prefer not to answer	1.0%	Yes	46.6%	Over \$75,000 - \$100,000	14.7%
Number of People in Household		No	52.4%	Over \$100,000 - \$150,000	12.5%
1	23.4%	Prefer not to answer	1.0%	Over \$150,000 - \$200,000	5.4%
2	37.7%	Sex		Over \$200,000	2.8%
3 or 4	28.8%	Male	48.6%	Prefer not to answer	4.6%
5 or more	9.3%	Female	49.2%		
Prefer not to answer	0.8%	Prefer not to answer	2.2%		

D1: What was the last grade or level of schooling that you completed?, D2: In what range does your total household income fall (before taxes)?, D3: Including yourself, how many people live in your household?, D4: How many children under the age of 18 live in your household?, D5: Are all adults in your household employed full-time outside of the residence?, and D6: Are you male or female?



Appendix



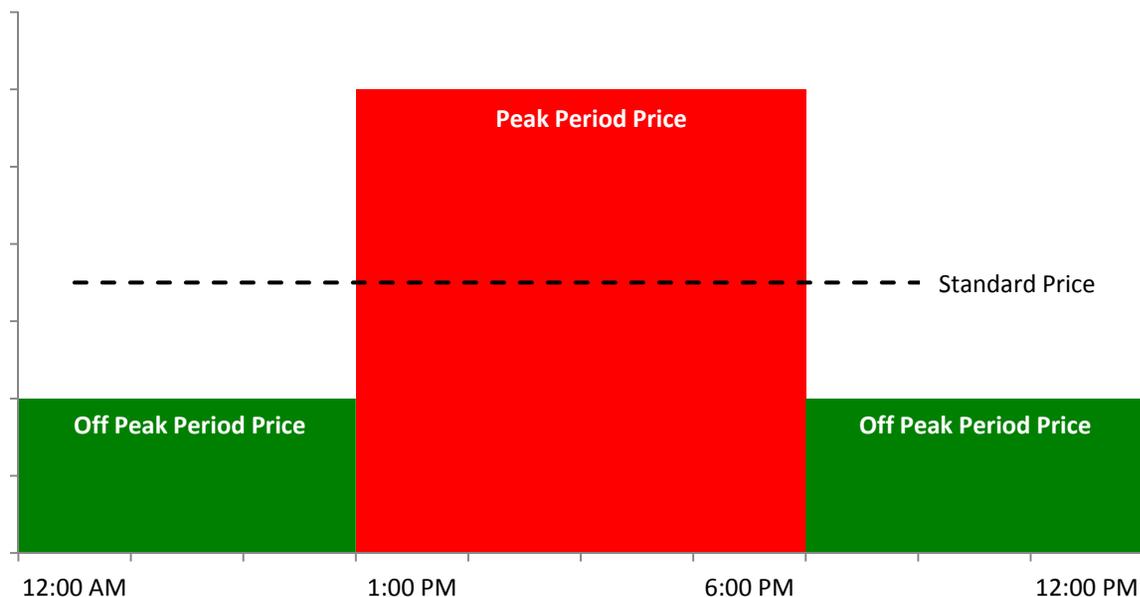
Rate Option Definitions



Time of Use

Under a time-of-use rate, the price a customer pays varies by season and by time of day. Prices are lower during “off-peak” hours, like nighttime, weekend and morning hours. Prices are higher during peak hours of electricity use, when demand is greatest.

Because time-of-use prices differ throughout the day, customers have an opportunity to save money by shifting electricity use to off-peak hours. Steps could include adjusting thermostats during peak hours; installing timers on water heaters, dehumidifiers and other equipment to make sure they are off during peak times; and postponing laundry and other activities until off-peak hours when demand and prices are lower. Customers who are unable or not willing to shift electricity use, would end-up paying more on the Time-of-Use rate.





Rate Option Definitions

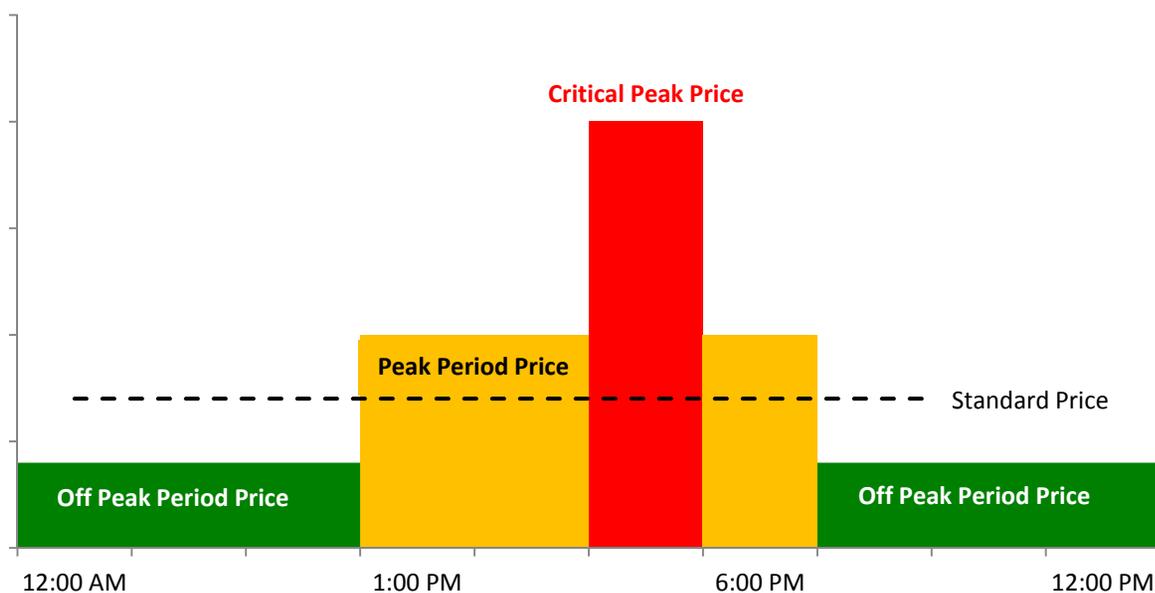


Critical Peak Pricing

Under a Critical Peak Pricing rate, the price a customer pays varies by season and by time of day. Customers on the Critical Peak Pricing plan benefit if they can adjust their use of electricity to “off-peak” hours, like mornings, nighttime and weekends. Critical Peak Pricing customers also have an additional opportunity to save money if they agree that when the electrical system occasionally experiences a very high demand for electricity, they will respond to the situation by further reducing their use of electricity during that time period.

Critical peak pricing alerts can be sent to a customer’s mobile device, email, telephone, or even through an in-home display.

Customers who are unable or not willing to shift electricity use or respond to a critical peak pricing alert, could end-up paying more on the Critical Peak Pricing rate.





Rate Option Definitions

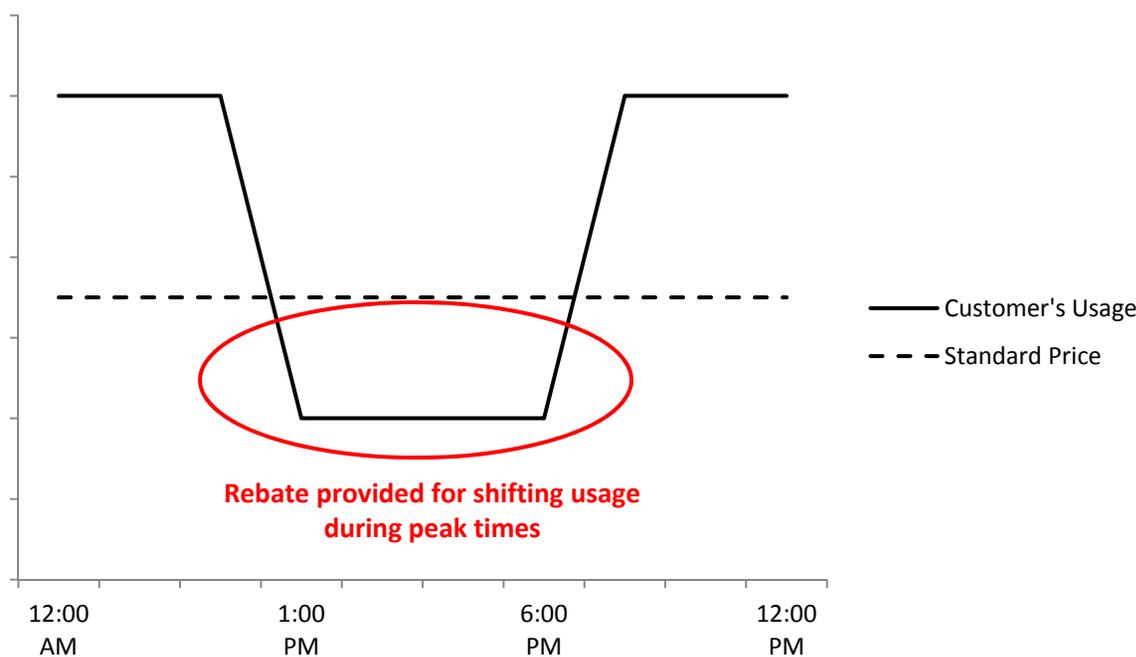


Peak Time Rebate

The Peak Time Rebate plan is designed for customers who are willing to try to shift electrical usage to off-peak hours, like mornings, nighttime and weekends, but who are not willing to risk paying more for electricity if they fail to shift their usage.

The customer is rewarded for shifting electric usage during peak hours when demand is greatest, but is not penalized for failing to shift electrical usage to off-peak hours.

Consumers' kilowatt hour reduction for the rebate is determined by comparing their usage during the peak period to their baseline usage during certain hours (e.g., 1PM-6PM) for the three to five weekdays prior to the peak period. If their usage during the peak period is less than their baseline usage, they receive a rebate which is based on a price per kilowatt hour saved.



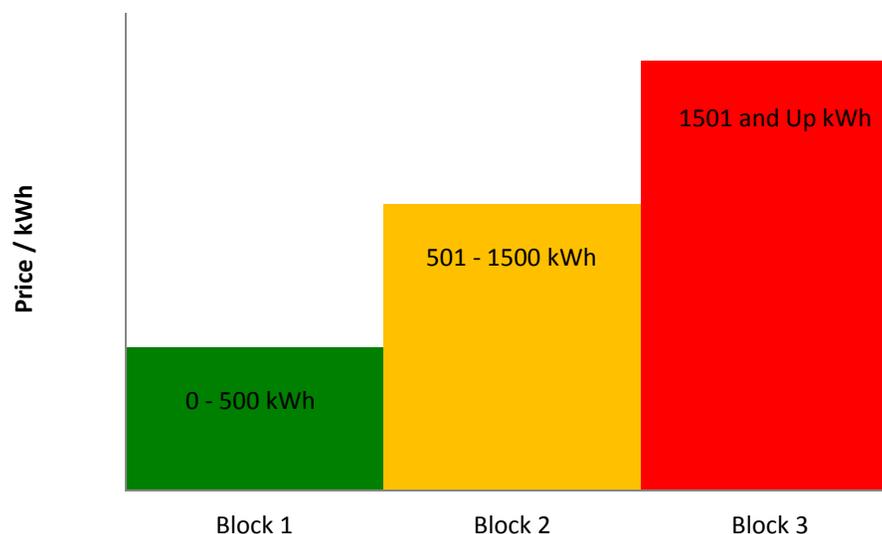


Rate Option Definitions



Inclining Block

The Inclining Block rate is designed for customers who are willing to reduce their overall consumption regardless of the time of day. The monthly pricing structure is designed to provide price intervals of consumption where the amount charged per kilowatt hour for each interval block increases as energy consumption increases. At the beginning of each month, pricing would return to the Block 1 rate.





Account# 1

Residential Demo (Acct 1)
701 E Kentucky St, Louisville, KY 40203

0

kWh billed Jan (1/1-1/1)
bill

0

kWh Used Week of Dec 22

34

kWh Latest Daily Usage
42% Lower
compared to last 90 days
average

0%

Profile
Complete

Charts

Data

Property

Electric

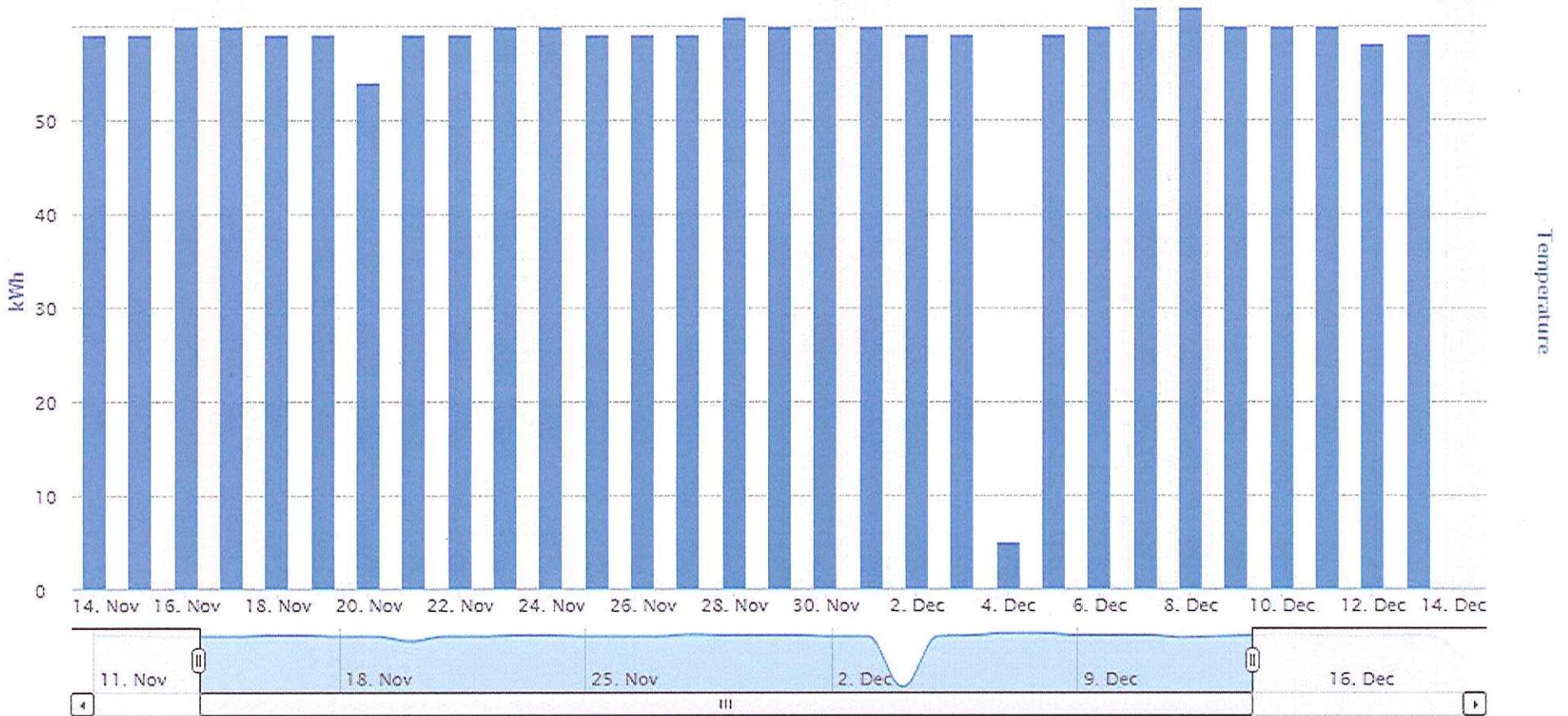
Consumption (kWh)

Bar

Daily

legend marker

Zoom 2w 1m 3m 1y 2y



Comparison ■

None

Comparison ■

None

Comparison ■

None

Comparison ■

None

More information about your weather can be found here: [KSDF](#)



Account# 1

Residential Demo (Acct 1)
701 E Kentucky St, Louisville, KY 40203

0

kWh billed Jan (1/1-1/1)
bill

0

kWh Used Week of Dec 22

34

kWh Latest Daily Usage
42% Lower
compared to last 90 days
average

0%

Profile
Complete

Charts

Data

Property

Electric

Consumption (kWh)

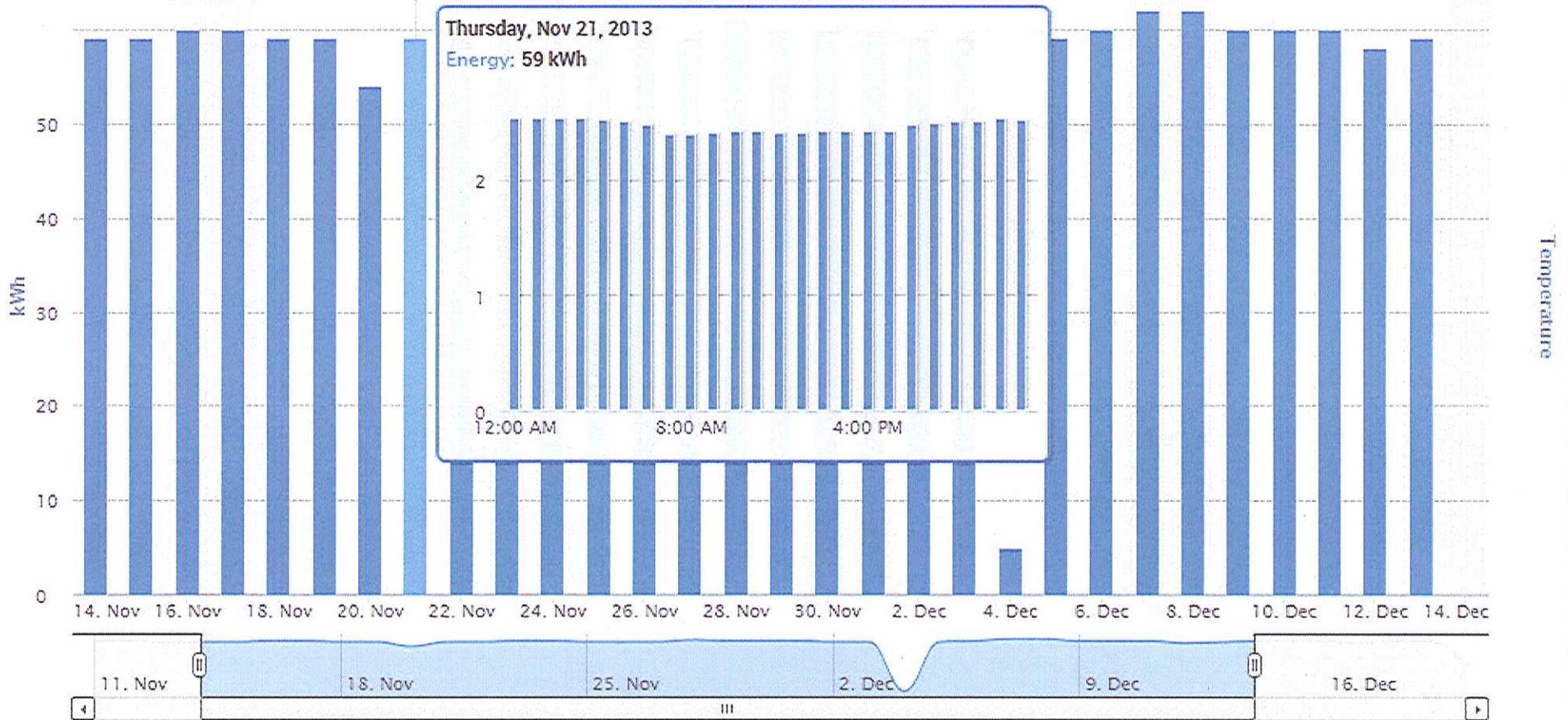
Bar

Daily

legend

marker

Zoom 2w 1m 3m 1y 2y



Comparison ■

None

Comparison ■

None

Comparison ■

None

Comparison ■

None

More information about your weather can be found here: [KSDF](#)

Select Property



Account# 1

Residential Demo (Acct 1)
701 E Kentucky St, Louisville, KY 40203

Charts

Data

Property

0

kWh billed Jan (1/1-1/1) bill

0

kWh Used Week of Dec 22

34

kWh Latest Daily Usage
42% Lower
compared to last 90 days average

0%

Profile Complete

Electric

kWh

Consumption (kWh)

103741044 (Energy)

Hour by Day

download

marker

full screen

Hour by Day	Meters	12-1am	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1pm	1-2	2-3	3-4	4-5	5-6	6-7	7-8
12/20/2013	103741044	2.53	2.53	2.52	2.52	2.52	2.51	2.47	2.42	2.37	2.37	2.38	2.40	2.44	2.44	0.00	0.00	0.00	0.00	0.00	0.00
12/19/2013	103741044	2.55	2.53	2.53	2.53	2.53	2.51	2.49	2.47	2.48	2.45	2.44	2.46	2.46	2.41	2.39	2.42	2.48	2.48	2.47	2.49
12/18/2013	103741044	2.55	2.55	2.56	2.56	2.55	2.54	2.49	2.44	2.43	2.45	2.45	2.46	2.45	2.44	2.46	2.46	2.46	2.45	2.48	2.51
12/17/2013	103741044	2.52	2.53	2.53	2.52	2.51	2.50	2.47	2.39	2.40	2.42	2.44	2.42	2.38	2.39	2.44	2.46	2.46	2.45	2.47	2.50
12/16/2013	103741044	2.54	2.54	2.54	2.54	2.54	2.53	2.46	2.45	2.47	2.44	2.45	2.45	2.45	2.45	2.46	2.44	2.43	2.46	2.49	2.52
12/15/2013	103741044	2.54	2.54	2.54	2.55	2.54	2.54	2.53	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.51	2.51	2.52
12/14/2013	103741044	2.53	2.53	2.53	2.53	2.53	2.53	2.52	2.51	2.50	2.50	2.50	2.50	2.50	2.51	2.51	2.51	2.51	2.51	2.51	2.51
12/13/2013	103741044	2.44	2.45	2.45	2.45	2.44	2.42	2.39	2.43	2.43	2.40	2.40	2.41	2.40	2.47	2.47	2.48	2.50	2.50	2.50	2.49
12/12/2013	103741044	2.52	2.51	2.53	2.50	2.50	2.49	2.45	2.41	2.40	2.40	2.40	2.39	2.40	2.41	2.40	2.37	2.37	2.36	2.40	2.42
12/11/2013	103741044	2.55	2.55	2.55	2.55	2.54	2.52	2.50	2.46	2.43	2.41	2.41	2.43	2.48	2.51	2.50	2.52	2.49	2.47	2.49	2.51
12/10/2013	103741044	2.56	2.56	2.56	2.56	2.55	2.54	2.51	2.45	2.43	2.40	2.43	2.45	2.46	2.46	2.47	2.48	2.48	2.46	2.51	2.53
12/9/2013	103741044	2.57	2.57	2.57	2.57	2.56	2.55	2.50	2.49	2.49	2.45	2.45	2.46	2.44	2.49	2.47	2.49	2.48	2.48	2.48	2.51
12/8/2013	103741044	2.59	2.59	2.59	2.59	2.58	2.57	2.56	2.56	2.56	2.56	2.56	2.55	2.56	2.56	2.56	2.56	2.56	2.55	2.55	2.56
12/7/2013	103741044	2.58	2.58	2.58	2.58	2.58	2.58	2.56	2.56	2.54	2.55	2.55	2.55	2.55	2.56	2.56	2.56	2.55	2.55	2.56	2.56
12/6/2013	103741044	2.54	2.54	2.53	2.53	2.52	2.51	2.49	2.41	2.41	2.40	2.42	2.41	2.41	2.42	2.43	2.44	2.57	2.54	2.56	2.56
12/5/2013	103741044	2.51	2.50	2.50	2.49	2.48	2.46	2.46	2.42	2.41	2.40	2.40	2.40	2.40	2.40	2.42	2.44	2.45	2.45	2.48	2.49