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Integrated Resource Plan

Technical Appendix - Demand Side Management

Volume 2

Executive Summary

East Kentucky Power Cooperative (EKPC) selects DSM programs to offer on the basis of meeting customer needs and resource planning objectives in a cost-effective manner. EKPC screens programs using qualitative criteria including customer acceptance, measure applicability, savings potential, and cost-effectiveness. Programs that meet these criteria are then analyzed in a rigorous fashion using standard (California) tests for cost-effectiveness.

EKPC evaluated 113 Demand-Side Management (DSM) measures for the 2012 Integrated Resource Plan (IRP). Of these, 10 represent Existing DSM programs and 103 represent New DSM measures for this plan. A two-step process was used in the evaluation: (1) Qualitative Screening, and (2) Quantitative Evaluation.

Forty-three (43) new measures passed the Qualitative Screen and were passed on to Quantitative Evaluation. In some cases, several measures were combined into one program. Also, a few of the measures did not lend themselves to quantitative analysis or require additional research in order to allow for analysis in the future, or were set aside for other sound reasons that came to light during the study. A total of 33 new DSM Programs were prepared for the Quantitative Evaluation.

Significantly more measures have been carried on to the quantitative analysis in this plan in comparison with the 2009 IRP. This is attributable to EKPC's adopting the Staff recommendation that EKPC take a somewhat more flexible approach in its consideration of measures coming out of the qualitative screening.

The results for the cost-effectiveness tests were generally favorable for the DSM programs. Of the 33 DSM Programs that were evaluated, 27 produced a Total Resource Cost test benefit-cost ratio of greater than 1.0. At this stage, EKPC conducted a final strategic review of the portfolio. Two programs were determined to be at the pilot stage, two programs had TRCs less than 1.1, and two required substantial customer investments and yet had relatively low participant test scores. Therefore, no impacts from these six programs are reflected in the final DSM portfolio. Thus, the final DSM portfolio in this 2012 IRP includes 21 "new" programs whose load impacts are not reflected in the base case load forecast.

In addition to these 21 New Programs, EKPC also has thirteen (13) Existing Programs in its DSM portfolio. In keeping with PSC Staff guidance, EKPC in this IRP has reflected the impacts of these programs in the load forecast.

EKPC presents the following DSM Program Portfolio for the 2012 IRP:

**Table DSM-1
Existing Programs**

Program Name	Class	Winter Peak Demand Impact in 2021 (MW) ¹	Summer Peak Demand Impact in 2021 (MW)	Annual Energy Impact in 2021 (MWh)
Button-Up Weatherization	Residential	-20.9	-7.0	-30,713
Button-Up with Air Sealing	Residential	-2.1	-0.7	-3,087
Heat Pump Retrofit	Residential	-4.5	-1.7	-42,275
Electric Thermal Storage	Residential	-6.1	0.0	109
Direct Load Control of AC & WH	Residential	-12.8	-55.0	-1,968
Residential Lighting	Residential	-14.3	-10.5	-95,155
Touchstone Energy (TSE) Home	Residential	-16.7	-4.6	-19,049
TSE Manufactured Home	Residential	-1.2	-0.4	-2,271
Tune-Up HVAC w/ Duct Sealing	Residential	-4.3	-1.6	-5,856
Commercial Lighting	Commercial	-4.9	-9.2	-45,973
Compressed Air	Industrial	-4.2	-10.6	-53,769
Gallatin Steel Interruptible	Industrial	-120.0	-120.0	0
Other Interruptible	Industrial	-8.0	-8.0	0

¹ Negative value means a reduction in load requirements

**Table DSM-2
New Programs**

Program Name	Class	Peak Demand Savings in 2021 (MW) ²	Total Resource Cost Test Benefit/Cost Ratio	Participant Test Benefit/Cost Ratio
"Beat the Peak" demand response	Residential	-8.6	2.77	Infinite
ENERGY STAR Central Air	Residential	0.0	1.17	1.35
Geothermal retrofit	Residential	-6.1	2.51	1.76
Home Energy Information	Residential	-8.2	1.76	Infinite
Low Income Weatherization	Residential	-34.2	1.71	Infinite
Mobile Home Retrofit	Residential	-8.8	1.84	2.31
Programmable Thermostat	Residential	0.0	2.88	4.70
DLC for Residential Pool Pump	Residential	0.0	2.24	Infinite
Advanced Weatherization Tier 2	Residential	-3.8	1.61	1.37
Advanced Weatherization Tier 3	Residential	-3.4	1.66	1.37
E -STAR Clothes Washer	Residential	-1.5	1.10	2.00
C&I Demand Response	Industrial	-18.9	3.18	3.51
Industrial Process	Industrial	-20.8	1.68	1.65
Industrial Variable Speed Drives	Industrial	-3.7	2.81	3.00
Commercial EMCS	Commercial	-3.5	1.57	2.16
DLC for Commercial Central AC	Commercial	0.0	3.77	Infinite
Building Performance	Commercial	-5.3	1.38	2.22
Commercial Duct Sealing	Commercial	-4.9	1.36	2.16
Commercial Efficient HVAC	Commercial	-1.9	2.07	3.37
Commercial New Construction	Commercial	-9.4	4.05	3.74
Small C&I Audit	Commercial	-2.4	1.26	3.31

These new programs are projected to produce over \$ 505 million of benefits and \$250 million of net benefits (2012 \$) on a total resource basis over the lifetime of the cost-effectiveness study (25 years). They will require an investment of just over 256 million (2012 \$) by EKPC, its member cooperatives, and participating customers in order to produce these savings.

² Negative value means a reduction in load requirements. Coincident with EKPC winter peak.

Major Enhancements since last IRP

EKPC has made several improvements to its DSM planning since the 2009 IRP. They include:

- (1) Included future impacts of existing DSM programs explicitly in the load forecast per the direction of the PSC.
- (2) Provided further consideration and detailed analysis of available options to provide more energy and demand savings for customers with electric heat.
- (3) More comprehensive set of DSM measures evaluated, incorporating feedback from member cooperatives, the Attorney General, Kentucky Division of Energy, environmental stewards, and other parties. Most recently, the Company is engaged in this effort with the members of the Collaborative formed out of case No. 2010-00238.
- (4) Cost-benefit analysis performed on a greater number of DSM measures by lowering the break-point on the Qualitative score.
- (5) More ambitious targets for energy (MWh) savings established, to align DSM portfolio with changing resource needs and to enhance the use of DSM as an environmental compliance option.
- (6) Updated avoided costs for capacity to match current plans for transmission, distribution, and generation investment (including environmental compliance costs).
- (7) Enhanced program designs to incorporate lessons learned in the field as well as best practice in the industry.

Introduction

East Kentucky Power Cooperative (EKPC) evaluates the future electric service requirements for its member cooperatives with balanced consideration of demand-side and supply-side resource options. The purpose of this section is to describe the evaluation of demand-side management (DSM) resources for inclusion in the integrated analysis portion of the 2012 Integrated Resource Plan (IRP).

DSM resources consist of customer energy programs that seek to change the power consumption of customer facilities in a way that meets planning objectives. They include conservation, load management, demand response, and other demand-side programs.

EKPC's DSM analysis is conducted on an aggregate basis, with all member cooperatives combined, rather than on an individual cooperative basis.

EKPC has used a two-step process to screen and evaluate DSM resources for inclusion in this plan. The first step is a qualitative assessment of a large number of potential DSM measures. In the Qualitative Screening step, each measure is scored against four criteria. Measures which pass the Qualitative Screening move on to the second step, which is a more rigorous Quantitative Evaluation. Measures are turned into DSM programs. In some cases, several measures are combined into one program. The Quantitative Evaluation considers all quantifiable benefits and costs of the program, and scores each program according to standard cost-effectiveness tests. DSM programs which pass the Quantitative Evaluation are passed on to the integrated analysis for inclusion in the IRP.

Comprehensive DSM Measure List

EKPC first developed a comprehensive list of 113 DSM measures to consider (see Exhibit DSM-1), of which 103 were new measures. This set of DSM measures covers all classes and major end-uses, and includes a robust set of available technologies and strategies for producing energy and peak demand (capacity) savings. This list was produced after careful review of several sources, including (1) PSC staff recommendations from the 2009 IRP ; (2) PSC orders in related cases involving DSM; (3) feedback from Kentucky Department of Energy, the Attorney General's office, and other relevant state agencies; (4) review of regional studies of energy efficiency opportunities; (5) the expertise of member cooperatives; (6) the current programs and IRPs of other Kentucky utilities; and (7) best practice DSM programs offered by utilities around the country.

Qualitative Screening Process

Next, EKPC developed the criteria it would use to screen these 113 measures (103 new measures). The four criteria chosen capture the major considerations as to whether a measure is suitable for robust quantitative analysis. The criteria consider the customer, the measure itself, the savings, and the economics. Each potential DSM measure was evaluated based on a scale of 1 to 5 against each of the four criteria.

The four criteria and a description of each are shown as Exhibit DSM-2.

Qualitative Screening Results

The results of the qualitative screening process are presented in Exhibit DSM-1 as well as in Table DSM-3 below. DSM measures which received a combined score of above 11 were passed on to the next phase, the Quantitative Evaluation Process. These measures which passed the screening are in **bold** in Exhibit DSM-1.

The following table summarizes the results of the qualitative screening process for new measures:

**Table DSM-3
Results of Qualitative Screening**

Class	Original # of Measures	# that PASSED Qualitative Screen
Residential	47	23
Commercial/Industrial	56	20
<i>TOTAL</i>	103	43

As the table shows, 43 new DSM measures passed qualitative screening. These 43 options were then evaluated in the quantitative evaluation process.

Quantitative Evaluation Process

The 43 measures that passed the qualitative screening process were next transformed into DSM programs. Some programs consist of more than one measure, and a few do not lend themselves to quantitative analysis at this point. In particular, price response and voltage reduction programs require additional work to be completed to bring these to the point where load impacts and costs can be reliably estimated. Also, the industrial motors program has been pre-empted by Federal efficiency standards. As a result, 33 new DSM programs were prepared for the Quantitative Evaluation.

For this IRP, EKPC is using the *DSMore* software package to conduct the more detailed quantitative evaluation. *DSMore* was developed in 2003 by Integral Analytics. In prior IRP work, EKPC used the EPRI *DSManager* software package. The *DSMore* software is now used to perform the same analyses formerly done using *DSManager*.

The Demand Side Management Option Risk Evaluator (“*DSMore*”) is a financial analysis tool designed to evaluate the costs, benefits, and risk profile of demand side management programs and measures. This tool combines Microsoft Excel spreadsheets with a separate component that performs detailed calculations. The user interfaces only with the Excel spreadsheet, which accepts inputs and returns outputs.

All of the standard DSM cost-effectiveness tests can be calculated using this tool: the Total Resource Cost test, the Utility Cost test, the Participant Cost test, the Ratepayer Impact Test, and the Societal Test. *DSMore* provides the results of those tests for both energy efficiency and demand response programs. This tool is one of the few packages viewed as “best practice” in the industry. *DSMore* has been used by more than 20 utilities, including other utilities in Kentucky.

DSMore calculates the impact of DSM programs on utilities and their customers. The software tracks both the physical changes, such as the level of power demand, and the dollar flows. *DSMore* produces a quantitative estimate of the costs and benefits for each of the parties using models of the electric system and its customers.

DSMore determines the cost-effectiveness of DSM programs by reporting results according to the cost-benefit tests established in the California Standard Practice Manual for Economic Analysis of Demand Side Programs³.

EKPC uses these tests to examine cost-effectiveness from three major perspectives: participant cost (PC), ratepayer impact measure (RIM), and total resource cost (TRC). A fourth perspective, the societal cost (SC), is treated as a variation on the TRC test.

³ California Public Utilities Commission and California Energy Commission, "Standard Practice Manual for Economic Analysis of Demand-Side Management Programs," Document Number P400-87-006, December 1987.

The results of each perspective can be expressed in a variety of ways, but in all cases, it is necessary to calculate the net present value of program impacts over the life cycle of those impacts. *DSMore* uses this information to calculate the benefit/cost (b/c) ratio for each of these four tests.

These tests are not intended to be used individually or in isolation. The first critical test that a DSM program must pass is the Participant Cost test, because without participants no savings occur. The results of tests that measure efficiency, such as the TRC and the SC, must be compared not only to each other, but also to the RIM test. This multi-perspective approach will require reviewers to consider tradeoffs between the various tests. The use of multiple tests helps ensure that the resulting portfolio of DSM programs attracts participants, results in the wise use of resource, and limits cross-subsidization.

EKPC is a full requirements Generation and Transmission provider for its 16 member cooperatives. Each cooperative is an independent non-profit corporation and operates distinct from EKPC. As a result, it is necessary to examine the impacts of DSM programs separately for EKPC and for the typical distribution cooperative. EKPC uses a customized version of *DSMore* to separately report the RIM test for EKPC and for the distribution cooperative.

Each of the 33 DSM programs was modeled in detail with *DSMore*. The model includes for each DSM program:

- Typical participant electricity savings (kWh and kW)
- Lifetime of the measure savings
- Incremental measure costs (participant costs)
- EKPC and distribution cooperative administrative costs
- Rebates to customers, and from EKPC to the cooperative
- Detailed retail and wholesale rate schedules
- Customer participation levels including free rider estimates.

In addition to the detailed modeling of the DSM programs, *DSMore* also includes a detailed model of the supply side costs. Major categories of supply side costs that are accounted for by the model include:

- Marginal energy costs (by hour of the year, correlated with weather and load)
- Marginal generation capacity costs (by year, including seasonal allocation)
- Marginal transmission & distribution capacity costs (by year, incl. seasonal allocation)
- Fossil fuel (natural gas & propane) costs (by year)
- Environmental externality costs (costs not internalized in energy or capacity costs; chiefly carbon related)

Quantitative Screening Results

DSMore calculates the net present value of the costs and benefits of each DSM program and presents the results in terms of the California Tests.

The following table summarizes the results:

**Table DSM-4
Results of Quantitative Screening**

	Total	TRC > 1.0	PC>1.0	Coop RIM>1.0	EKPC RIM > 1.0
New Residential	19	15	17	4	6
New Commercial/ Industrial	14	12	14	2	4
TOTAL	33	27	31	6	10

As this table shows, the results for the cost-effectiveness tests were generally favorable for the DSM programs. Of the 33 DSM Programs that were evaluated, 27 produced a Total Resource Cost test benefit-cost ratio of greater than 1.0. Two programs have Participant Test results below 1.0, and they also have TRCs below 1.0.

At this stage, EKPC conducted a final strategic review of the portfolio. Two programs were determined to be at the pilot stage, two programs had TRCs less than 1.1, and two required substantial customer investments and yet had relatively low participant test scores. Therefore, no impacts from these six programs are reflected in the final DSM portfolio. Thus, the final DSM portfolio in this 2012 IRP includes 21 “new” programs whose load impacts are not reflected in the base case load forecast.

Exhibit DSM-3 provides program descriptions for each of the new DSM programs. Exhibit DSM-4 provides assumption sheets for each of the twenty-one new DSM programs. Exhibit DSM-5 provides more detailed results of the quantitative screen in the form of summary sheets for each of the twenty-one new DSM programs.

In addition to these 21 New Programs, EKPC also has thirteen (13) Existing Programs in its DSM portfolio. In keeping with PSC Staff guidance, EKPC in this IRP has reflected the impacts of these programs in the load forecast.

Exhibit DSM-6 provides program descriptions for each of the existing programs, assumption sheets, and summary sheets. Exhibit DSM-7 provides the load impacts of both existing and new programs.

Recommendations

Coming out of the Quantitative Screening and review, 21 New DSM programs along with 13 Existing DSM programs comprise the DSM portfolio and were passed on to the the integrated analysis portion of the IRP. The integrated analysis determines the direction that EKPC should take in meeting the future needs of its member cooperatives and their customers.

EKPC presents the following DSM Program Portfolio for the 2012 Integrated Resource Plan:

**Table DSM-5
Existing Programs**

Program Name	Class	Winter Peak Demand Impact in 2021 (MW) ⁴	Summer Peak Demand Impact in 2021 (MW)	Annual Energy Impact in 2021 (MWh)
Button-Up Weatherization	Residential	-20.9	-7.0	-30,713
Button-Up with Air Sealing	Residential	-2.1	-0.7	-3,087
Heat Pump Retrofit	Residential	-4.5	-1.7	-42,275
Electric Thermal Storage	Residential	-6.1	0.0	109
Direct Load Control of AC & WH	Residential	-12.8	-55.0	-1,968
Residential Lighting	Residential	-14.3	-10.5	-95,155
Touchstone Energy (TSE) Home	Residential	-16.7	-4.6	-19,049
TSE Manufactured Home	Residential	-1.2	-0.4	-2,271
Tune-Up HVAC w/ Duct Sealing	Residential	-4.3	-1.6	-5,856
Commercial Lighting	Commercial	-4.9	-9.2	-45,973
Compressed Air	Industrial	-4.2	-10.6	-53,769
Gallatin Steel Interruptible	Industrial	-120.0	-120.0	0
Other Interruptible	Industrial	-8.0	-8.0	0

⁴ Negative value means a reduction in load requirements

**Table DSM-6
New Programs**

Program Name	Class	Peak Demand Savings in 2021 (MW) ⁵	Total Resource Cost Test Benefit/Cost Ratio	Participant Test Benefit/Cost Ratio
"Beat the Peak" demand response	Residential	-8.6	2.77	Infinite
ENERGY STAR Central Air	Residential	0.0	1.17	1.35
Geothermal retrofit	Residential	-6.1	2.51	1.76
Home Energy Information	Residential	-8.2	1.76	Infinite
Low Income Weatherization	Residential	-34.2	1.71	Infinite
Mobile Home Retrofit	Residential	-8.8	1.84	2.31
Programmable Thermostat	Residential	0.0	2.88	4.70
DLC for Residential Pool Pump	Residential	0.0	2.24	Infinite
Advanced Weatherization Tier 2	Residential	-3.8	1.61	1.37
Advanced Weatherization Tier 3	Residential	-3.4	1.66	1.37
E -STAR Clothes Washer	Residential	-1.5	1.10	2.00
C&I Demand Response	Industrial	-18.9	3.18	3.51
Industrial Process	Industrial	-20.8	1.68	1.65
Industrial Variable Speed Drives	Industrial	-3.7	2.81	3.00
Commercial EMCS	Commercial	-3.5	1.57	2.16
DLC for Commercial Central AC	Commercial	0.0	3.77	Infinite
Building Performance	Commercial	-5.3	1.38	2.22
Commercial Duct Sealing	Commercial	-4.9	1.36	2.16
Commercial Efficient HVAC	Commercial	-1.9	2.07	3.37
Commercial New Construction	Commercial	-9.4	4.05	3.74
Small C&I Audit	Commercial	-2.4	1.26	3.31

These new programs are projected to produce over \$ 505 million of benefits and \$250 million of net benefits (2012 \$) on a total resource basis over the lifetime of the cost-effectiveness study (25 years). They will require an investment of just over 256 million (2012 \$) by EKPC, its member cooperatives, and participating customers in order to produce these savings.

⁵ Negative value means a reduction in load requirements. Coincident with EKPC winter peak.

DSM program design and implementation are complex and dynamic undertakings. It is possible that DSM programs that are selected through this evaluation process may not be implemented as they have been described in this document. DSM programs that are ultimately launched will first be subjected to a much more rigorous program design effort. In certain cases, a demonstration or pilot project may precede full-scale implementation to test the validity of the program concept. This could mean that certain program concepts are modified, and some may not ultimately be implemented.

Estimated Impacts

This section provides the estimated impacts of both the Existing and New DSM programs in utility sales and coincident peak demands. Impacts for Existing DSM programs are accounted for in the load forecast. Impacts for New DSM programs are accounted for in the integrated resource plan.

The following table provides the forecasted impacts of the Existing DSM programs. Negative values denote reductions in load requirements while positive values denote increases in load requirements.

Table DSM-7
Load Impacts of Existing Programs
(negative value= reduction in load)

Year	Impact on Energy Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	-32,211	-137.2	-141.2
2013	-68,475	-147.8	-155.1
2014	-104,449	-158.4	-169.0
2015	-139,324	-169.0	-182.8
2016	-174,238	-179.5	-196.6
2017	-209,181	-190.1	-210.4
2018	-243,994	-199.8	-220.3
2019	-272,885	-207.9	-224.5
2020	-286,348	-214.0	-226.9
2021	-300,007	-220.0	-229.3
2022	-293,425	-223.4	-229.4
2023	-288,025	-227.0	-229.6
2024	-282,167	-230.3	-229.6
2025	-276,206	-233.5	-229.7
2026	-270,262	-236.7	-229.7

The following table provides the projected estimated impacts of the New DSM programs. Negative values denote reductions in load requirements while positive values denote increases in load requirements.

Table DSM-8
Load Impacts of New Programs
(negative value = reduction in load)

Year	Impact on Energy Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	-72,035	-26.7	-28.3
2013	-114,746	-47.5	-52.2
2014	-157,505	-66.9	-74.4
2015	-198,524	-80.5	-90.9
2016	-239,543	-94.2	-107.4
2017	-278,862	-104.9	-117.9
2018	-318,180	-115.7	-128.4
2019	-353,713	-125.6	-138.0
2020	-389,246	-135.6	-147.5
2021	-424,778	-145.6	-157.1
2022	-450,919	-153.2	-163.7
2023	-477,059	-160.9	-170.4
2024	-500,727	-167.5	-176.7
2025	-524,394	-174.1	-183.0
2026	-548,062	-180.7	-189.4

Year by year impacts for each individual program are provided in Exhibit DSM-7.

Factoring Environmental Cost Considerations into DSM Evaluation

EKPC has explicitly factored environmental costs into this evaluation of DSM resources. There are three major categories of environmental cost: (1) the cost of purchasing allowances; (2) the capital costs of compliance at power plants; and (3) externality costs.

EKPC has accounted for all three categories of environmental cost in its DSM evaluation. The following table describes how this was accomplished:

Table DSM-9
Accounting for Environmental Costs

ENVIRONMENTAL COST	WHERE ACCOUNTED FOR	SPECIFICS
Allowance purchases	Marginal energy costs	SOx and NOx
Capital investments for compliance	Marginal capacity costs	Primarily Scrubbers, SCRs, other controls
Externalities	Externality adder	Used in Societal Cost test; value is set to \$0/MWh. Value based on current assessment of likely value placed on carbon dioxide over the 15 year planning period.

Exhibit DSM-1

**Complete List of DSM Measures (Existing and New)
& Results of Qualitative Screen**
Measures that passed the Qualitative Screen are IN BOLD

Residential

1	Wholistic Weatherization	New
2	Low income weatherization	New
3	Enhanced Button-Up (air sealing)	Existing
4	Enhanced Tune-Up (duct sealing)	Existing
5	Mobile home retrofit program	New
6	Low flow showerhead with faucet aerator/pipe insulation	New
7	Direct load control - pool pump	New
8	Direct Load Control - air conditioners & water heaters	Existing
9	DLC of heat pump strip heat	New
10	Beat the Peak	New
11	Electric Thermal Storage	Existing
12	Residential Efficient Lighting	Existing
13	High efficiency outdoor lighting	New
14	LED lighting	New
15	Enhanced Touchstone Home (thermal sealing/bypass)	New
16	Touchstone Energy Home	Existing
17	Touchstone Energy Manufactured Home	Existing
18	ENERGY STAR Refrigerator	New
19	ENERGY STAR Room Air Conditioner	New
20	ENERGY STAR Clothes Washers	New
21	ENERGY STAR Freezers	New
22	ENERGY STAR Home electronics	New
23	ENERGY STAR Windows	New
24	ENERGY STAR Dishwashers	New
25	ENERGY STAR Dehumidifiers	New
26	Room AC exchange & recycle program	New
27	Refrigerator/Freezer Recycling	New
28	Remove old second refrigerators	New
29	Remove old second freezers	New
30	Ceiling Fans	New
31	Heat pump dryer	New
32	Well water pump	New
33	Efficient pool pump	New
34	Cold climate heat pump	New
35	Heat retrofit/ early replace: resistance to heat pump	Existing
36	Inefficient heat pump to geothermal early replacement	New
37	SEER 10 heat pump to SEER 15 early replacement	New
38	ENERGY STAR Central Air Conditioner	New
39	Ductless mini-split heat pump	New
40	Inefficient Central Air Conditioner to SEER 15	New
41	High efficiency furnace fan motors	New
42	Dual Fuel add-on to heat pump	New
43	Dual Fuel heat pump replacing electric resistance heat	New
44	Heat pump water heater	New
45	Instantaneous water heater	New
46	Solar water heater	New
47	Passive Solar (new construction)	New

Residential (continued)

48	Photovoltaics (customer sited)	New
48	Wind turbine (customer sited)	New
50	Home Energy Information Program	New
51	Polarized Refrigerant oxidant agent	New
52	Time of use rates	New
53	Inclining block rates	New
54	Programmable thermostats with electric furnace heat	New
55	Multi-family program	New

Commercial

1	Commercial HVAC	New
2	Demand Response	New
3	Commercial Building Performance	New
4	Commercial New Construction	New
5	Efficient refrigeration equipment	New
6	Small C&I audit program	New
7	Building operator certification program	New
8	Geothermal heat pump	New
9	Evaporative cooling	New
10	Advanced ventilation	New
11	High efficiency HVAC motors	New
12	Early replacement inefficient unitary/split system HVAC	New
13	Cool roof program	New
14	High performance glazings	New
15	Duct sealing	New
16	Thermal energy storage	New
17	Heat pump water heaters	New
18	Drain heat recovery water heaters	New
19	LED exit signs	New
20	Advanced lighting program	Existing
21	Efficient cooking equipment	New
22	Efficient clothes washers	New
23	ENERGY STAR Vending machines	New
24	Energy Management Systems	New
25	DLC of irrigation pumps	New
26	DLC of central air conditioners	New
27	Energy efficient schools	New
28	Farms program: fans, pumps, irrigation	New
29	Time of use rates	New
30	Combined heat & power	New
31	Stand-by generation program	New
32	Daylighting	New
33	Solar hot water	New
34	Photovoltaics	New
35	Wind turbine	New

Industrial/Other

1	Motors	New
2	Variable speed drives	New
3	Demand Response	New
4	Compressed air	Existing
5	Industrial process	New
6	Process cooling	New
7	Refrigerated Warehouse	New
8	High efficiency transformers	New
9	Automotive and transportation sector equipment	New
10	Livestock, equine, poultry and meat processing sector	New
11	Chemicals sector	New
12	Machinery/machine tools sector	New
13	Aluminum sector	New
14	Plastics sector	New
15	Computer and electronics sector	New
16	Combined heat and power	New
17	Other onsite generation (conventional)	New
18	Photovoltaics	New
19	Wind turbine	New
20	LED Traffic signals	New
21	Water/Wastewater Treatment facilities	New
22	Conservation Voltage Reduction	New
23	Emergency Generator demand response	New

Exhibit DSM-2

Qualitative Screening criteria

Scoring system: 1 – 5 , where 1 means POOR and 5 means EXCELLENT

CRITERIA	COMMENTS/EXAMPLES
1. Customer Acceptance	<p>What will the response of customers be to the offer to participate in the program or to install the measure(s) in their facilities? POOR = measures that reduce the quality of the energy service equipment, are excessively difficult to install, or might interfere with vital activities in the establishment (home, business, industrial plant). Example: Retailer would be unlikely to put in window shades to reduce cooling loads because they want the product displays to be visible.</p> <p>Have the efficiency gains been superseded by standards or code requirements? Example: SEER 12 central air conditioners are no longer an efficiency measure because Federal appliance efficiency standards require a minimum SEER of 13. Is the measure commercially available today? Measures that are still in the R&D stage or that are no longer manufactured would score low on this criteria.</p> <p>Will the measure save energy or demand in the EKPC climate?</p> <p>Is the measure a good fit for the DSM objectives that EKPC has?</p> <p>Is there a better measure available for the same end-use application? Example: Triple glazed windows versus low e double pane window.</p>
3. Savings Potential	<p>How substantial are the savings likely to be?</p> <p>How measurable or quantifiable are the savings?</p> <p>Is the measure technically reliable such that savings are assured?</p> <p>Is the marketplace capturing the savings already without a utility program?</p> <p>POOR = Savings are small or not easily quantified</p>
4. Cost Effectiveness	<p>Given typical savings, typical measure costs, and a conservative (high) estimate of future avoided energy and capacity costs, how cost effective is this program likely to be using the Total Resource Cost test?</p> <p>POOR = clearly below 1 (say 0.3 on the TRC using a high estimate of future avoided costs)</p> <p>EXCELLENT = clearly above 1 (say 3-5 or higher on the TRC)</p>

Exhibit DSM-3

Program Descriptions for New DSM Programs

Program Descriptions for New DSM Programs for the 2012 IRP

Introduction

This section of the IRP describes the new DSM programs. These programs are in the planning stage, and appear cost-effective as designed to this point. These program concepts passed our qualitative screening, and there is at least some level of experience with the program in the utility community such that solid data exist for conducting a quantitative cost-effectiveness analysis.

DSM program design and implementation are complex and dynamic undertakings. It is possible that DSM programs that are selected through this evaluation process may not be implemented as they have been described in this document. DSM programs that are ultimately launched will first be subjected to a much more rigorous program design effort. In certain cases, a demonstration or pilot project may precede full-scale implementation to test the validity of the program concept. This could mean that certain program concepts are modified, and some may not ultimately be implemented.

DSM programs that are included as New programs for this IRP are listed below and are also described in this exhibit:

- “Beat the Peak” Demand Response Program (Residential)
- ENERGY STAR Central Air Conditioner (Residential)
- Geothermal Retrofit Program (Residential)
- Home Energy Information Program (Residential)
- Low Income Weatherization (Residential)
- Mobile Home Retrofit (Residential)
- Programmable Thermostat with Electric Furnace Retrofit (Residential)
- Direct Load Control for Pool Pumps (Residential)
- Advanced Weatherization Tier 2 (Residential)
- Advanced Weatherization Tier 3 (Residential)
- ENERGY STAR Clothes Washer (Residential)
- Commercial & Industrial Demand Response
- Industrial Process
- Industrial Variable Speed Drives
- Commercial Energy Management and Control Systems
- Direct Load Control for Commercial Air Conditioning
- Commercial Building Performance
- Commercial Duct Sealing
- Commercial Efficient HVAC
- Commercial New Construction
- Small Commercial and Industrial Audit

“Beat the Peak” Residential Demand Response

Program Description

This program is a voluntary residential demand response program that uses technology to influence customers to reduce their consumption during periods of very high power costs or a critical shortage of generation.

Target Market

The program will be available for all residential customers but is particularly designed to produce critical peak demand savings from end uses other than central air conditioning or water heating.

Energy Star® Central Air Conditioners

Program Description

This program is designed to provide incentives to residential retail members to purchase ENERGY STAR qualified central air conditioners. The program also features services to members to insure proper installation and sizing and installations, factors which have been shown to be critical aspects of producing and maintaining energy savings with central air conditioners.

Target Market

The program is designed to reach residential customers who are purchasing and installing new central air conditioners.

Geothermal Retrofit

Program Description

This program is designed to provide incentives to residential retail members to replace working but inefficient (SEER 11 or less) air source heat pumps with geothermal heat pumps.

Target Market

The program is designed to reach residential customers who currently heat their home with older and less efficient air source heat pumps.

Home Energy Information

Program Description

This program uses information to help customers manage their energy use by providing reports that compare their energy use to the energy use of similar households. The program combines customer-specific energy usage data with demographics and housing data to produce specific, targeted recommendations to motivate the customer to install energy efficiency measures and save electricity.

Target Market

The program will be available for all residential customers but marketing efforts will be directed toward households with higher than average electricity usage.

Low Income Weatherization Program

Program Description

This program is designed to deliver weatherization energy efficiency services to existing residential low income customers based on cutoffs for household income. It is anticipated that the homes will be primarily single family owner occupied homes.

The low income program is distinct from other residential weatherization programs because part of the housing stock is often older and substandard in comparison to middle and upper income housing. As a result, certain repairs may be required in order to install the energy efficiency measures over and above what would be required in other housing stock. In some cases there will be health and safety concerns that will need to be addressed as part of the work.

The program is designed to work in tandem with the state Weatherization Assistance Program by reaching more low income households sooner with the full set of measures that are cost-effective. Weatherization measures to be provided include insulation, air conditioner tune-up, duct sealing, air sealing, programmable thermostats, hot water conservation measures, and compact fluorescent light bulbs. EKPC will pay the full cost of installing these measures in the low income program.

Target Market

The program is designed to reach residential customers who are income eligible using the eligibility requirements established by the State of Kentucky for the Federal Weatherization Assistance Program. The primary target includes electrically heated low income homes.

Mobile Home Retrofit Program

Program Description

This program focuses on the unique needs of East Kentucky's mobile home market. The construction design of mobile homes makes certain weatherization retrofits (particularly insulation) more challenging to install. On the other hand, there are also more opportunities to save energy, particularly in older mobile homes (constructed before 1994 and especially those built before 1976 when the first HUD standards were issued). Mobile homes typically use more energy per square foot than site-built homes.

Measures that will be offered in the mobile home retrofit program include: duct sealing, attic insulation, air sealing, air conditioner/heat pump tune-up, programmable thermostat, incentives for replacing inefficient refrigerators, water heater measures, and compact fluorescent light bulbs.

Target Market

This program is designed to serve residential members who live in mobile homes that are heated with electricity.

Programmable Thermostat with Electric Furnace Retrofit

Program Description

This program is designed to provide incentives to residential retail members to install programmable thermostats. Properly installed programmable thermostats save 5-10% of heating and cooling energy. This program is designed for residential customers who heat their homes with electricity but do not have a heat pump. Some studies have shown that programmable thermostats can significantly increase morning peak loads when used with heat pumps.

Target Market

The program is designed to reach residential customers who heat their homes with electricity using a primary heat system that is not a heat pump.

Direct Load Control of Residential Pool Pumps

Program Description

The objective of the program is to reduce peak demand through the installation of load control switches on residential pool pumps.

Peak demand reduction is accomplished by cycling equipment on and off according to a predetermined control strategy. It is anticipated that the pool pump loads will be completely curtailed during control events. The typical control duration is four hours. Participating customers receive an annual bill credit incentive.

EKPC plans to treat the pool pump as an add-on appliance to the DLC program it is currently implementing. The third party administrator in that program will also provide enrollment, installation, service calls, and measurement & verification services for the pool pump component.

EKPC will offer an incentive of \$10 per year for each pool pump under control.

Target Market

The program targets are homes with pool pumps. The incentive is available to any residential retail member of a participating EKPC cooperative who has a qualifying pool pump.

Advanced Weatherization Tier 2

Program Description

EKPC plans to introduce a new approach to residential weatherization that establishes three tiers of weatherization measures, where the energy savings and customer incentives increase for each higher tier. This program represents the second tier. It includes all of the measures in the current Button-Up with Air Sealing and Tune-Up programs (Tier 1), plus additional levels of insulation and air sealing that increase the savings to 150% of the BTU heat reduction in Tier 1. The program will reduce duct leakage to at or below the 2009 IECC level. The program will also identify and complete a continuous thermal envelope with air barrier.

Target Market

The primary targets for this program are retail members who currently heat their home with electricity. Particular targets include homes with unfinished basements, homes that have partition walls separating a crawl space or garage, and Cape Cod style home (2 stories).

Advanced Weatherization Tier 3

Program Description

EKPC plans to introduce a new approach to residential weatherization that establishes three tiers of weatherization measures, where the energy savings and customer incentives increase for each higher tier. This program represents the highest tier, Tier 3. It includes all of the measures in the current Button-Up with Air Sealing and Tune-Up programs (Tier 1) , plus additional levels of insulation and air sealing that increase the savings to 200% of the BTU heat reduction in Tier 1. The program will reduce duct leakage to at or below the 2009 IECC level. The program will also identify and complete a continuous thermal envelope with air barrier.

Target Market

The primary targets for this program are retail members who currently heat their home with electricity. Particular targets include homes with unfinished basements, homes that have partition walls separating a crawl space or garage, and Cape Cod style home (2 stories).

Energy Star® Clothes Washers

Program Description

This program is designed to provide incentives to residential retail members to purchase ENERGY STAR qualified clothes washers. Through superior design and system features, ENERGY STAR qualified clothes washers clean clothes using 50% less energy than standard washers. ENERGY STAR clothes washers use less water per load, saving energy needed to heat the hot water. In addition, ENERGY STAR clothes washers extract more water from clothes during the spin cycle. This reduces drying time, thereby saving energy needed to dry clothes.

Target Market

The program is designed to reach residential customers who are purchasing new clothes washers.

Commercial & Industrial Demand Response

Program Description

This demand response program is designed to provide incentives to large customers to reduce their electricity demands on the grid, with short notice (less than 24 hours), for short periods of time, in response to short term conditions external to the customer facility. Typically, those conditions will be either an excessively high price or a shortage of available power. Participants are reimbursed for the cost of the smart meter needed, and receive an annual incentive of \$30 per kW offered.

Target Market

The program is designed for customers with peak demands above 50 kW.

Industrial Process Efficiency

Program Description

This program provides financial and engineering resources to industrial customers to save electricity in their industrial process. Incentives are structured as a standard offer payment per 1st year kWh with partial payment upon approval of the engineering proposal, and final payment on verified savings. The program as designed includes an audit, a feasibility study, proposal review and approval, and savings verification.

Target Market

The program is designed for industrial customers who have process loads that represent a significant share of their electricity consumption.

Industrial Variable Speed Drives Program

Program Description

This program is designed to promote variable speed drives and drive systems. The design includes efforts to promote wider application of VSDs. This will be a rebate program with mail in form.

Target Market

This program is designed to improve motor efficiency for the non-OEM motor purchase market. The facility must have been in service for two years. In service motors at all commercial, industrial, and institutional facilities are eligible.

Commercial Energy Management and Control Systems

Program Description

This program is designed to provide medium & large commercial customers incentives for installing systems of controls and sensors that control and reduce a building's energy usage. Incentives are offered for new systems, replacing non-working systems, and adding functionality to existing systems.

Target Market

The incentive is available to any existing commercial or industrial facility in the service territory of a participating EKPC cooperative. The facility must have been in service for at least two years.

Direct Load Control for Commercial Air Conditioning

Program Description

The objective of the program is to reduce peak demand and energy usage through the installation of load control switches on commercial air conditioners.

Peak demand reduction is accomplished by cycling equipment on and off according to a predetermined control strategy. Central air conditioning and heat pump units are cycled on and off. The typical control duration is four hours. Participating customers receive an annual bill credit incentive.

EKPC plans to rely on a third party administrator to provide enrollment, installation, service calls, and measurement & verification services.

EKPC plans to offer an incentive of \$40 per year for each commercial air conditioner being controlled by a switch. This recognizes the load contribution of the commercial facility. The air conditioner incentive will consist of \$20 per month bill credits during four hot weather months.

EKPC has a goal of enrolling 6,000 commercial customers over the next five years. The participation goal represents a cumulative penetration of 20% of the current eligible market of commercial facilities with central air conditioning.

Target Markets

The primary program targets are commercial customers with central air conditioning (including heat pumps). The incentive is available to any commercial retail member of a participating EKPC cooperative who has a qualifying central air conditioner.

Commercial Building Performance Program

Program Description

This program addresses the need to boost the energy performance of existing equipment and systems by offering building owners and managers proper tuning, operation and maintenance services for HVAC and other equipment in existing buildings. This program combines features of duct sealing with heat pump/air conditioning tune-up (for smaller buildings) and retro-commissioning (for larger buildings).

The heat pump/air conditioning tune-up package includes:

- All accessible ductwork sealed
- Filters changed/cleaned
- Thermostat checked/adjusted for proper function
- Indoor and outdoor coils cleaned
- Refrigerant charge checked and corrected if needed
- Airflow checked and corrected if needed

Retro-commissioning is the systematic process of ensuring that an existing building's energy systems operate in an optimal manner by examining actual performances against design performance. The majority of savings tend to come from adjusting the energy management systems and controls.

Target Market

The program is designed to serve any existing commercial or industrial facility that uses electricity for space cooling and/or space heating.

Commercial Duct Sealing

Program Description

This program is designed to provide incentives to commercial customers to reduce air leakage from ducts in commercial buildings by sealing duct leaks. Duct loss will be measured before and after the duct sealing work is performed in order to determine savings. Only contractors trained or approved by EKPC may be used.

Target Market

The incentive is available to any existing commercial or industrial facility in the service territory of a participating EKPC cooperative. The facility must have been in service for at least two years.

Commercial Efficient HVAC Program

Program Description

This program promotes high efficiency packaged HVAC equipment. It provides incentives for unitary commercial air conditioners and heat pumps that exceed the 2006 Federal Guidelines of 13 SEER and 7.7 HSPF.

Target Market

The incentive is available to any existing commercial or industrial facility that uses packaged single or split air conditioning or heat pump units, usually rooftop units.

Commercial New Construction Program

Program Description

This program promotes integrated design, commissioning, and more advanced technologies in commercial new construction. Electricity savings are realized across a number of end-uses, with the majority occurring from lighting, cooling, and heating. It is anticipated that new K-12 schools would be served by this program.

Target Market

This program is designed to serve the commercial new construction and major renovation market, including the K-12 schools market.

Small Commercial and Industrial Audit

Program Description

This program is designed to deliver energy efficiency services to existing small commercial and industrial facilities. These facilities are typically more difficult to reach with services and face unique obstacles to procuring and financing energy efficiency products and services. The program will consist of walk-through energy audits provided for no or nominal cost to small businesses and non-profits who expressed interest in investing in energy efficient equipment. During the audit, very cost effective measures that are easy to install (primarily lighting measures) are installed at no charge to the customer. Financing and rebates are offered for more capital and/or labor intensive measures.

Target Market

The program is designed for small commercial and institutional customers with peak demands below 50 kW.

Exhibit DSM-4

New Program
Assumption Sheets

2012 IRP version

"Beat the Peak" program - residential demand response

A voluntary residential demand response program that uses technology to influence customers to reduce their consumption during periods of very high power costs or a critical shortage of generation.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 18,953 kWh, 8.02 kW (coincident with winter system peak), 4.02 kW (summer)</p> <p>After Participant 18,947 kWh, 7.82 kW (coincident with winter system peak), 3.82 kW (summer)</p>	Whole house load
	Whole house load with savings of 0.2 kW during critical peak periods. Critical peak is defined as a 5 hour period on peak days in December, January, February, plus, June, July, and August. 1 - 6 PM in summer, 6-11 AM in winter. 50% recovery over next 5 hours(0.1kW per hour). Based on review of several critical peak pilots and programs across the nation. Program is targeted at end uses other than central air conditioning or water heating.
Lifetime of savings	20 Years.
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 0	Participant does not bear any direct costs in this program.
Administrative Cost EK: \$50,000 one-time fixed cost, \$355,000 annual cost.	Note: variable admin costs are escalated at 3% per year. Values here are for 2010. Fixed annual costs include M&V, admin, marketing, IT, and communications costs. No variable per participant costs. No annual variable costs.
Coop: 0	EKPC pays all administrative costs for the program.
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 8,000 new per year, 5 years (2012-2016)	Targeting residential homes without Central AC.
Rebates Co-op to Participant \$ 0 per year	No incentive; voluntary program.

ENERGY STAR Residential Central Air Conditioning program w/ proper sizing & installation

2012 IRP version

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 2,092 kWh, 2.07 kW (coinc. with summer system peak)</p> <p>After Participant 1,563 kWh, 1.55 kW (coinc. with summer system peak).</p>	Standard efficiency new Central air conditioner (SEER 13)
Lifetime of savings	15 Years
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 300 through 2015, then \$550. 3% escalation	Difference in installed cost (\$550) between SEER 13 Central AC and SEER 15 CAC - based on ENERGY STAR. Less the \$250 KY tax credit thru 2015.
Administrative Cost EK \$10,000 fixed annual (2012-2026)	Based on existing heat pump program, plus contractor training.
Co-op \$ 177 per new participant	Based on existing heat pump program
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 2,600 per year, 15 years (2012-2026), 10% free riders	Targets 25% of the replacement market each year. Assumes 15 year life so approx 7% of existing households with CAC represent replacement market annually. Free riders from Xcel DSM plan (2009).
Rebates Co-op to Participant \$100	Based on other utility programs. \$100 through 2015; \$250 for 2016-2026

Geothermal retrofit

Replaces working but inefficient (SEER 11 or less) air source heat pumps with geothermal heat pumps

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 16,380 kWh, 11.82 kW (coincident with winter peak), 4.00 kW (summer)</p> <p>After Participant 9,426 kWh, 4.70 kW (coincident with winter system peak), 2.32 kW (summer)</p>	<p>Low efficiency heat pump: SEER 10, HSPF 6. Scaled for a 2,500 square foot home. Standard electric hot water heater (2007 update).</p> <p>Geothermal heat pump for 2,500 square foot home. Electric water heater with desuperheater from geothermal (2007 update).</p>
Lifetime of savings	15 Years
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 3,800	Cost premium associated with the installed cost of the geothermal system over and above the future installed cost of a new ASHP system. 30% Federal Tax credit is included. Total installed cost for a 4 ton geothermal unit including trenching is \$14,000. Future cost of ASHP discounted is \$6,000. Federal tax credit is \$4,200.
Administrative Cost EK \$5,000 fixed annual (2012-2016)	Based on 2010 actual for heat pump program, increased for more participants.
Co-op \$177 per new participant	Based on 2011 survey of members.
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 200 new per year, 2012-2016. 0% free riders.	Penetration of 0.4% per year, for 5 year period until end of Federal tax credit Dec 31, 2016.
Rebates Co-op to Participant \$ 1,500	Based on Indiana program

2012 IRP version

Home Energy Information

2012 IRP version

Example: O-Power and their program of gathering data on the consumer to compare them to their electricity consumption peers. M&V results show savings of 2%.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 14,136 kWh, 4.29 kW (coincident with winter peak), 3.06 kW (summer)</p>	Typical residential customer
<p>After Participant 13,853 kWh, 4.20 kW (coincident with winter system peak), 3.00 kW (summer)</p>	Typical customer with 2% savings applied
Lifetime of savings	1 Year. Savings accrue as long as customer continues to participate
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 0	No out of pocket expense is incurred by the participant
<p>Administrative Cost EK \$ 250,000 one time setup (2012), \$12 annual cost per participant per year (2012-2026)</p>	One time setup fee estimated from SMECO program report. Annual per customer cost estimated from review of several utility reports, particularly Glendale CA utility.
Co-op \$0 per new participant	EKPC pays all costs for this program directly
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p>	Current rates in effect as of June, 2011.
<p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	Current rates in effect as of June, 2011.
<p>Participation - 100,000 each year, 2012-2026. 0% free riders.</p>	Based on other utility implementations and reports of low opt-out rates. Free riders set to zero because savings impact evaluation results are based on pre-post/treatment/control approach which accounts for the impact of free riders in the control group.
<p>Rebates Co-op to Participant \$ 0</p>	No financial incentive. Behavioral motivation based on peer comparison.

Low Income Weatherization program

Insulation, a/c tune-up, duct sealing, air sealing, programmable t-stats, hot water conservation measures and cfls to low income households; to work in tandem with state weatherization program.

<u>Assumption</u>	<u>Source</u>
Load Impacts Before Participant 11,286 kWh, 8.81 kW (coincident with winter system peak), 3.45 kW (summer)	HVAC loads for a typical heat pump in typical residence
After Participant 8,286 kWh, 6.47 kW (coincident with winter system peak), 2.53 kW (summer)	HVAC loads for a typical heat pump home reduced by 3,000 kWh. Savings estimate based on data from existing low income weatherization programs in the region.
Lifetime of savings	15 years
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 0	EKPC and members will cover 100% of the program
Administrative Cost EK \$40,000 fixed annual (2012-2026)	0.25 FTE for implementation admin, plus M&V
Co-op \$2,500 per new participant	Based on implementation costs for Button Up, Tune Up, and comparable low income weatherization programs.
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 1,500 per year, 15 years (2012-2026)	Targets 30% of the eligible non-served market in 15 years. Cutoff is 80% of KY median household income (\$40k in 2009 according to US Census). Market size based on EKPC 2009 End Use Survey question 26. Nationally, 20% of the market has been served by the WAP program. Electrically heated households only.
Rebates Co-op to Participant \$0	Direct installation program - no participant out of pocket costs

2012 IRP version

Mobile Home Retrofit = "MH_RETRO"

2012 IRP version

Source

Assumption

<p>Load Impacts Before Participant 17,330 kWh, 8.66 kW (coinc. with winter system peak), 2.43 kW (summer)</p> <p>After Participant 14,154 kWh, 7.03 kW (coincident with winter system peak), 1.96 kW (summer)</p>	<p>Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing mobile homes: 18% heat pump, 82% furnace/CAC. Refrigerator, electric water heater, 4 incandescent light bulbs.</p> <p>Same mix but with savings as follows: HVAC (2,700), Refrigerator (160), Water Heating (90), CFL(200).</p>
<p>Lifetime of savings</p>	<p>12 Years (weighted mix of measures)</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 1,200</p>	<p>Mix of measures with penetrations: insulation, duct sealing, air sealing, tune up, refrigerator incentive, water heater conservation, compact fluorescents.</p>
<p>Administrative Cost EK \$50,000 fixed annual (2012-2026)</p> <p>Co-op \$250 per new participant</p>	<p>0.25 FTE., contractor training, M&V.</p> <p>Audit, duct report, blower door, inspection, rebate processing.</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 500 per year, 15 years (2012-2026)</p>	<p>Targets 20% of the existing electric heat mobile homes over the next 15 years.</p>
<p>Rebates Co-op to Participant \$700</p>	<p>Based on program as implemented by other similar utilities with measure mix</p>

2012 IRP version Programmable Thermostat with Electric Furnace Retrofit Program = "PROGSTAT"

Install programmable t-stat to save heating and cooling energy.

Source

Assumption

<p>Load Impacts Before Participant 14,936 kWh, 9.62 kW (coincident with winter system peak), 2.05 kW (summer)</p> <p>After Participant 14,187 kWh, 9.62 kW (coincident with winter system peak), 1.95 kW (summer)</p>	<p>Typical electric furnace with standard efficiency central air conditioner in existing 1700 square foot home</p> <p>5 % savings on annual kWh from operation of programmable thermostat. Source: ACEEE. Notes: Deviation from recommended settings and schedules can significantly lower actual savings.</p>
<p>Lifetime of savings 10 years</p>	<p>10 years -Vermont study</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 115. 3% escalation</p>	<p>Installed cost of a programmable thermostat. Based on Missouri and PECO plans. Device cost is \$70 and installation labor cost is \$45.</p>
<p>Administrative Cost EK \$5,000 fixed annual (2012-2026), \$0 per new participant. 3% esc</p> <p>Co-op \$15 per new participant. 3% esc.</p>	<p>Rebate program with mail in form. Form processing time.</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011. Current rates in effect as of June, 2011.</p>
<p>Participation - 600 per year, 15 years (2012-2026). 20% free riders</p>	<p>Achieves 20% increase in penetration of programmable thermostats among existing homes with electric furnace and central AC in 15 years. Free riders based on CA DEER.</p>
<p>Rebates Co-op to Participant \$50</p>	<p>Based on survey of current utility programs in US</p>

DLC for Residential Pool Pump = "DLC1PP"

2012 IRP version

Reduce peak demand through installation of switches on residential pool pumps

Source

Assumption

<p>Load Impacts Before Participant 2,368 kWh, 0.75 kW (coincident with summer system peak)</p> <p>After Participant 2,361 kWh, 0.00 kW (coincident with summer system peak)</p>	<p>Typical pool pump load</p> <p>Pool pump load control is 4 hour curtailment on peak days May through Sept. Also 50% cycling for the ensuing 2 hour recovery period to prevent creating a new peak (in conjunction with existing DLC program for air conditioners and water heaters). 80% energy payback.</p>
<p>Lifetime of savings</p>	<p>20 Years.</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 0</p>	<p>Participant does not bear any direct costs in this program.</p>
<p>Administrative Cost</p> <p>EK: \$50,000 fixed annual cost, \$197 per new participant (one time) and \$ 3.95 per ongoing participant (each year)</p> <p>Coop: 0</p>	<p>Note: variable admin costs are escalated at 3% per year. Values here are for 2012.</p> <p>Fixed annual costs include M&V, admin, marketing and paging costs attributable to adding the pool pump load to the DLC program. Variable one time costs per participant include switch cost, installation, scheduling, and enrollment. Pool pumps will be installed only during visit for installing the central AC. Annual variable costs are for servicing, and reconnect/removal.</p> <p>EKPC pays all administrative costs for the program.</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 1,500 new per year, 5 years (2012-2016)</p>	<p>Goal is 21 % of the eligible market (households with pool pumps) by year 5.</p>
<p>Rebates Co-op to Participant \$ 20 per year</p>	<p>Consistent with existing DLC program</p>

Advanced Weatherization Tier 2

A tiered approach to weatherization that will incent based on various levels of defined achievements. The tiers would be defined and the rebates would be graduated based on levels.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 10,500 kWh, 8.12 kW (coinc. with winter system peak), 2.47 kW (summer)</p> <p>After Participant 5,933 kWh, 4.59 kW (coincident with winter system peak), 1.40 kW (summer)</p> <p>Lifetime of savings</p> <p>Generation Capacity Cost - Hybrid</p>	<p>Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing single family homes. 70% heat pump, 30% furnace/CAC.</p> <p>Same mix but with 43.5% savings, representing all Button Up with Air Sealing measures plus Tier 2 advanced measures</p> <p>15 Years (weighted mix of measures)</p> <p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 3,323</p>	<p>Button Up with Air Sealing measures plus Tier 2 advanced measures, completing thermal envelope with air barrier, reducing duct leakage to 2009 IECC level, and minimum BTU heat loss reduction of 27,000.</p>
<p>Administrative Cost EK \$0 fixed annual (2012-2026) Co-op \$463 per new participant</p>	<p>No incremental administrative costs over and above costs to run Button Up with Air Sealing program</p> <p>Based on admin costs for Button Up with Air Sealing program</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 75 in 2013, 150 per year, (2014-2026), 10% free riders</p>	<p>Targets 20% of the existing electric forced air heat and centrally cooled homes over the next 15 years. Total allocated to tiers based on judgment about share of participants opting for different levels of service. Free Riders based on Frontier Assoc study for LG&E/KU, and CPUC DEER updated.</p>
<p>Rebates Co-op to Participant \$1,050</p>	<p>In order to cover 30% of participant costs.</p>

Advanced Weatherization Tier 3

A tiered approach to weatherization that will incent based on various levels of defined achievements. The tiers would be defined and the rebates would be graduated based on levels.

<u>Assumption</u>	<u>Source</u>
Load Impacts Before Participant 10,500 kWh, 8.12 kW (coinc. with winter system peak), 2.47 kW (summer)	Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing single family homes. 70% heat pump, 30% furnace/CAC.
After Participant 4,410 kWh, 3.41 kW (coincident with winter system peak), 1.04 kW (summer)	Same mix but with 58% savings, representing all Button Up with Air Sealing measures plus Tier 2 and Tier 3 advanced measures
Lifetime of savings	15 Years (weighted mix of measures)
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 4,430	Button Up with Air Sealing measures plus Tier 2 and Tier 3 advanced measures, completing thermal envelope with air barrier, reducing duct leakage to 2009 IECC level, and minimum BTU heat loss reduction of 36,000.
Administrative Cost	No incremental administrative costs over and above costs to run Button Up with Air Sealing program
EK \$0 fixed annual (2012-2026)	Based on admin costs for Button Up with Air Sealing program
Co-op \$463 per new participant	
Rate Schedule - Retail	
Average Residential Rate for Co-ops	Current rates in effect as of June, 2011.
Cust chrg \$9.62, Energy Rate \$.08966	
Rate Schedule - Wholesale	
East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 50 in 2013, 100 per year, (2014-2026), 10% free riders	Targets 20% of the existing electric forced air heat and centrally cooled homes over the next 15 years. Total allocated to tiers based on judgment about share of participants opting for different levels of service. Free Riders based on Frontier Assoc study for LG&E/KU, and CPUC DEER updated.
Rebates	
Co-op to Participant \$1,400	In order to cover 30% of participant costs.

2012 IRP version

ENERGY STAR Clothes Washer Rebate Program = "CLWSHR_R"

2012 IRP version

Source

Assumption

<p>Load Impacts Before Participant 3,400 kWh, 0.73 kW (coincident with winter system peak), 0.31 kW (summer)</p> <p>After Participant 3,050 kWh, 0.66 kW (coincident with winter system peak), 0.28 kW (summer)</p> <p>Lifetime of savings 12 years</p>	<p>Typical electric water heater with typical electric dryer. Electricity savings from ENERGY STAR Clothes washers come from lower water heating and clothes drying energy.</p> <p>ENERGY STAR clothes washers save on average 250 kWh on water heating and 100 kWh on clothes drying each year.</p> <p>Source: Northeast Energy Efficiency Partnership (NEEP) planning document (Sept 2004).</p>
<p>Generation Capacity Cost - Hybrid</p> <p>Participant Costs \$260 one time; \$ (20) per year O&M cost</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p> <p>Difference between retail price of an ENERGY STAR clothes washer and a new standard efficiency washer. Source: NEEP (2004, ENERGY STAR 2011). The negative \$20 per year O&M cost represents <u>savings</u> in water and sewer costs by using less water.. Verified with more recent reports.</p>
<p>Administrative Cost EK \$10,000 fixed annual (2012-2026), \$0 per new participant</p> <p>Co-op \$ 15 per new participant</p>	<p>Marketing with Trade Allies. Rebate program with mail in form.</p> <p>Form processing time.</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 2,225 per year, 15 years (2012-2026), 10% Free Riders</p> <p>Rebates Co-op to Participant \$50</p>	<p>Share increase of 20% in target market assuming multiplier effect of 2:1 (although free drivers not modelled). Free Riders based on LG&E/KU.</p> <p>Based on survey of current utility programs in US</p>

2012 IRP version

C&I Demand Response Program = " DEMRSV1"

This program provides incentives to large customers to reduce their electricity demands on the grid, with short notice, for short periods of time, to reduce the utility peak load and avoid the purchase of expensive power.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 10,500 kWh, 35.0 kW (coincident with winter system peak), 35.0 kW (summer) After Participant 0 kWh, 0.0 kW (coincident with winter system peak), 0.0 kW (summer)</p>	<p>This is the curtailable load, consisting of a 35 kW load during the 300 highest priced hours using marginal energy costs. 35 kW represents 15% of the average peak demand for the EKPC customer base with peak demands above 50 kW. Source: load research and billing data.</p> <p>Zero load, since the curtailable load is curtailed.</p>
<p>Lifetime of savings</p>	<p>20 Years</p>
<p>Generation Capacity Cost - Hybrid Participant Costs \$ 600 one time per new participant; \$1000 per participant per year</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p> <p>One time cost is the metering cost; annual cost is for program administration and communications: receiving curtailment notices, responding, accounting. Onsite generation is not assumed, and so costs for operating on-site generation (fuel or O&M) are not included.</p>
<p>Administrative Cost</p>	<p>One time cost is to design program, purchase & install curtailment infrastructure (software, hardware, training). Annual cost is for administering the program each year.</p>
<p>EK \$150,000 fixed one time; \$50,000 fixed annual (2012-2031), \$0 per new participant</p>	<p>Marketing, customer assistance, coordination</p>
<p>Co-op \$500 annual per participant per year</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Rate Schedule - Retail Blue Grass Energy blend of large C&I rates: demand charge of \$7.66 per kW Rate Schedule - Wholesale East Kentucky E-2 rate. Participation - add 150 in 2012, add 200 in 2013, add 150 in 2014</p>	<p>After ramp up, 10% of the eligible customers, or 500 customers, participate.</p>
<p>Rebates Co-op to Participant \$500 one-time; \$1050 per year</p>	<p>One time rebate for meter cost; annual is payment of \$30 per kW-year</p>

Industrial Process

This program provides financial and engineering resources to industrial customers to save electricity in their industrial process. Incentives are structured as a standard offer payment per 1st year kWh with partial payment upon approval of the engineering proposal, and final payment on verified savings.

<u>Assumption</u>	<u>Source</u>
Load Impacts	Load for the typical large industrial account at EKPC. Peaks derived from EK small industrial load profile in Dsmore
Before Participant 20,521,270 kWh, 5,942 kW (coincident with winter system peak), 7,089 (summer)	
After Participant 17,699,600 kWh, 5,125 kW (coincident with winter system peak), 6,114 (summer)	Load after efficiency measures based on typical project savings of 13.8%.
Lifetime of savings 10 years	Source: Energy Trust of Oregon
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 987,600 per account	Typical cost of \$0.35 per annual kWh savings from studies in Delaware and California
Administrative Cost	Fixed costs based on Compressed Air program: or Marketing, Trade Allies, Tracking, Processing, Eval, Cust Svc. Variable cost is 15% of measure cost (based on Puget Sound Energy report) and includes audit, feasibility study, proposal review and approval, savings verification
EK \$30,000 fixed annual, \$ 148,000 per new participant	EKPC administers this program.
Co-op \$ 0	
Rate Schedule - Retail Owen Schedule II	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Cust chrg \$21.31 , Demand charge \$6.13 per kW, Energy Rate \$.06498 per kWh
Current rates in effect as of June, 2011.	
Participation - 3 new participants per year (2012-2026) 15% free riders.	This is based on achieving savings of 7% of total industrial load by 2026. This is an ambitious goal according to a review of several state and utility studies: Delaware, CA, Puget Sound Energy, Energy Trust of Oregon, CEPCI. Free rider estimate from LG&E/KU and CA CPUC
Rebates	
Co-op to Participant \$ 40,000 per participant	Rebate required to bring Combined RIM to 1

Industrial Variable Speed Drives Program = "VSD_1"

2012 IRP version

Assumption

<p>Load Impacts Before Participant 240,000 kWh, 18.9 kW (coincident with winter system peak), 26.0 kW (summer)</p> <p>After Participant 141,600 kWh, 11.2 kW (coincident with winter system peak), 15.4 kW (summer)</p>	<p>Motor load for a typical 100 HP set of motors where variable speed drives apply, with inventory matching market size shares, and high efficiency.</p> <p>Motor load for a typical 100 HP set of motors with variable speed drives (VSDs). 41% savings compared to motor load without VSDs. Source: Northeast Energy Efficiency Partnership (NEEP), Strategic Review, Sept 2004.</p>
<p>Lifetime of savings 15 years</p>	<p>Source: Northeast Energy Efficiency Partnership (NEEP), Strategic Review, Sept 2004</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 21,750</p>	<p>Cost of the variable speed drive measure, \$0.22 per annual kWh saved. Source: NEEP, 2004, adjusted to 2011 \$.</p>
<p>Administrative Cost EK \$20,000 fixed annual (2012-2026), \$0 per new participant Co-op \$15 per new participant</p>	<p>Marketing, Trade Allies, Tracking, Processing, Eval, Cust Svc. Includes efforts to promote wider application of VSDs. Rebate program with mail in form. Prior value increased based on feedback from Dan Playforth Dec 2011.</p> <p>Form processing time.</p>
<p>Rate Schedule - Retail Owen Schedule II</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011. Cust chrg \$21.31 , Demand charge \$6.13 per kW, Energy Rate \$.06498 per kWh</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 53 per year, 15 years (2012-2026); 15% free riders.</p>	<p>Achieves 45% share of the applicable non-OEM annual motor purchase market. Free riders based on CA DPUC</p>
<p>Rebates Co-op to Participant \$ 5,000</p>	<p>\$50 per hp based on range provided by Dan Playforth Dec 2011</p>

2012 IRP version

Commercial Energy Management & Control Systems

Offer medium & large commercial customers incentives for installing systems of controls and sensors that control and reduce a building's energy usage. Incentives are offered for new systems, replacing non-working systems, and adding functionality to existing systems.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 845,000 kWh, 200 kW (coincident with winter system peak), 250 kW (summer)</p> <p>After Participant 815,000 kWh, 193.8 kW (coincident with winter system peak), 246.2 kW (summer)</p>	<p>Typical 50,000 square foot medium size commercial building. Targeted building types include offices, large retail, education, and health care facilities.</p>
<p>Lifetime of savings 15 years</p>	<p>15 Years (ACEEE, Peco, Xcel)</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 15,000 per building, 3% escalation</p>	<p>Based on estimated costs of \$0.30 per square foot, several sources compared (Vermont EE study, ACEEE Ohio study)</p>
<p>Administrative Cost EK \$10,000 fixed annual (2012-2026), \$300 per new participant</p> <p>Co-op \$ 0 per new participant</p>	<p>Fixed: Marketing, Trade Allies, Tracking, Processing, M&V. Variable: enroll, pre-inspect, post-inspect. Program is administered by EKPC</p>
<p>Rate Schedule - Retail South Kentucky B rate .</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011. Current rates in effect as of June, 2011.</p>
<p>Participation - 60 per year, 15 years (2012-2026), 10% free riders</p>	<p>Targeting 50% penetration of applicable floorspace over 15 years. Free riders based on CA DEER and Xcel Colorado.</p>
<p>Rebates Co-op to Participant \$ 7,500 per bldg</p>	<p>Industry practice is 50% of measure cost</p>

2012 IRP version

DLC for Commercial Central AC = "DLC_AC_C"

Reduce peak demand and energy usage through the installation of load control devices on commercial air conditioners.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 8,750 kWh, 3.52 kW (coincident with summer system peak)</p> <p>After Participant 8,720 kWh, 1.52 kW (coincident with summer system peak)</p>	<p>Typical 2,500 square foot commercial building, air conditioning load.</p>
Lifetime of savings	50% cycling of air conditioner compressor on peak days during May through September. 20 Years.
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 0	Participant does not bear any direct costs in this program.
<p>Administrative Cost EK: \$200,000 first year startup costs, \$100,000 fixed annual cost, \$197 per new participant (one time) and \$ 3.95 per ongoing participant (each year)</p> <p>Coop: 0</p>	<p>Note: variable admin costs are escalated at 3% per year. Values here are for 2012. Fixed annual costs include M&V, admin, marketing and paging costs attributable to a Commercial CAC DLC program. Variable one time costs per participant include switch cost, transportation, installation, scheduling, and enrollment. Annual variable costs are for servicing, and reconnect/removal.</p>
Rate Schedule - Retail South Kentucky B rate .	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 1,200 new per year, 5 years (2012-2016)	Goal is 20 % of the eligible market (commercial buildings with central AC) by year 5.
Rebates Co-op to Participant \$ 40 per year	Consistent with existing DLC program, proportionate to kW contribution

Commercial Building Performance Program

2012 IRP version

To boost the energy performance of existing equipment and systems by offering proper tuning, operation and maintenance services for HVAC and other equipment in existing buildings. Equates to TuneUp for small buildings & retro-commissioning for large buildings.

Source

Assumption

<p>Load Impacts Before Participant 68,000 kWh, 13.6 kW (coincident with winter system peak), 15.11 kW (summer)</p> <p>After Participant 55,700 kWh, 11.14 kW (coincident with winter system peak), 12.38 kW (summer)</p>	<p>Typical 10,000 square foot commercial building, 50% saturation of electric heat, heating, cooling and ventilation loads</p> <p>Same building after building performance measures are done: savings are 1.23 kWh per square foot (based on review of several studies and programs)</p>
<p>Lifetime of savings 7 years</p>	<p>consensus across several studies</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 3,690, 3% escal.</p>	<p>\$0.30 per 1st year kWh, based on review of several programs.</p>
<p>Administrative Cost EK \$10,000 fixed annual (2012-2026), \$0 per new participant. 3% escalation.</p> <p>Co-op \$378 per new participant. 3% esc.</p>	<p>Marketing, Trade Allies, Tracking, Onsite, Eval, Cust Svc. Based on Residential Tune-Up program (2011 coop survey of labor hours & rates)</p>
<p>Rate Schedule - Retail South Kentucky B rate .</p>	<p>Current rates in effect as of June, 2011.</p>
<p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p>
<p>Participation - 300 per year, 15 years (2012-2026), 5% free riders</p>	<p>Achieves 40% penetration of applicable market in 15 years. Unit is 10,000 square feet of treated floorspace. Free riders estimate from LG&E/KU.</p>
<p>Rebates Co-op to Participant \$ 1,845</p>	<p>50% of measure costs</p>

Commercial Duct Sealing

2012 IRP version

Reduce air leakage from ducts in commercial buildings by sealing duct leaks.

Source

Assumption

Load Impacts

Before Participant
13,875 kWh, 2.77 kW (coincident with
winter system peak), 3.07 kW (summer)

After Participant
11,375 kWh, 2.27 kW (coincident with
winter system peak), 2.52 kW (summer)

Typical 2,500 square foot commercial building, 50% unitary AC, 50% heat pump. Includes heating, cooling, and ventilation loads.

Same facility after duct sealing is completed: savings are 1.0 kWh per square foot

Lifetime of savings 15 years

15 Years (KEMA Missouri study)

Generation Capacity Cost - Hybrid

PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)

Participant Costs \$ 1,250, 3% escalation

Based on estimated costs of \$0.50 per square foot, several sources compared (Reliant, Modera, PG&E)

Administrative Cost

EK \$10,000 fixed annual (2012-2026), \$0 per new participant

Marketing, Trade Allies, Tracking, Processing, M&V.

Co-op \$ 378 per new participant

Same as Residential Tune Up program

Rate Schedule - Retail

South Kentucky B rate .

Current rates in effect as of June, 2011.

Rate Schedule - Wholesale

East Kentucky E-2 rate.

Current rates in effect as of June, 2011.

Participation -1000 per year, 15 years (2012-2026). 10% free riders

Targeting 30% penetration of applicable floorspace over 15 years. Free riders based on CA DEER and LG&E KU.

Rebates

Co-op to Participant \$625

Industry practice is 50% of measure cost

2012 IRP version

Commercial Efficient HVAC Program = "COMMCOOL"

Promotes high efficiency packaged HVAC equipment.

Source

Assumption

Load Impacts

Before Participant

11,875 kWh, 1.87 kW (coincident with winter system peak), 3.52 kW (summer)

After Participant

10,257 kWh, 1.60 kW (coincident with winter system peak), 3.05 kW (summer)

Typical 2,500 square foot commercial building, 50% unitary AC, 50% heat pump, standard efficiency HVAC = SEER 13, HSPF 7.7

Typical 2,500 square foot commercial building, 50% unitary AC, 50% heat pump, high efficiency HVAC = SEER 15, HSPF 9.0.

Lifetime of savings 15 years

15 Years (Northeast Energy Efficiency Partnership, Minn. Municipal Utilities, CA PUC)

Generation Capacity Cost - Hybrid

PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)

Participant Costs \$ 380 through 2015, then \$540. 3% escalation

Based on PNNL 2010 study. KY Tax 30% tax credit applied through 2015.

Administrative Cost

EK \$10,000 fixed annual (2012-2026), \$0 per new participant

Marketing, Trade Allies, Tracking, Processing, Eval, Cust Svc. Rebate program with mail in form.

Co-op \$177 per new participant

Based on Heat Pump program - Cost information provided by various coops in September 2011 survey of hours and rates.

Rate Schedule - Retail
South Kentucky B rate .

Current rates in effect as of June, 2011.

Rate Schedule - Wholesale
East Kentucky E-2 rate.

Current rates in effect as of June, 2011.

Participation - 800 per year, 15 years (2012-2026); 10% free riders

Targeting 20% market share of annual HVAC replacement market. Free riders based on LG&EKU

Rebates

Co-op to Participant \$270

Industry practice is 50% of incremental cost

Commercial New Construction Program = "CNEWCONS"

Promotes integrated design, commissioning, and more advanced technologies in commercial construction.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 70,000 kWh, 20.0 kW (coincident with winter system peak), 25.0 kW (summer)</p> <p>After Participant 56,000 kWh, 17.7 kW (coincident with winter system peak), 21.1 kW (summer)</p>	<p>New construction 5,000 square foot facility.</p> <p>New construction 5,000 square foot facility with 20% savings, from lighting and HVAC measures primarily</p>
Lifetime of savings 20 years	Northeast Energy Efficiency Partnership, (NEEP), Public Service of New Mexico.
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 4,200	Based on \$0.30 per annual kWh reported costs (PSNM, PECO, Missouri, Texas, NJ, NEEP) .
Administrative Cost EK \$10,000 fixed annual (2012-2026), \$ 300 per new participant Co-op \$0 per new participant	<p>Fixed annual: marketing, trade ally, tracking & processing, customer support. The per participant cost includes enrollment, inspections.</p> <p>EKPC administers the program.</p>
Rate Schedule - Retail South Kentucky B rate .	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 440 per year, 15 years (2012-2026). 10% free riders.	Annual commercial new construction floorspace estimated from load forecast. Targeting 50% penetration each year. Free riders from Xcel filing.
Rebates Co-op to Participant \$2,100	Industry practice is 50% of incremental cost

2012 IRP version

Small Commercial & Industrial Audit Program

Walk-through energy audits provided for no or nominal cost to small businesses and non-profits who expressed interest in investing in energy efficient equipment. During the audit, very cost effective measures that are easy to install are installed at no charge to the customer. Financing and rebates are

Source

Assumption

<p>Load Impacts Before Participant 46,800 kWh, 9.67 kW (coincident with winter system peak), 12.00 kW (summer)</p> <p>After Participant 42,438 kWh, 8.77 kW (coincident with winter system peak), 10.88 kW (summer)</p>	<p>Whole building load for typical 2,600 square foot commercial building. EUI of 18 kWh per square foot.</p> <p>Whole building load for 2,600 square foot building after savings from program measures are applied. Based on measured savings from several programs nationally.</p>
<p>Lifetime of savings</p>	<p>10 Years (source: DEEM database)</p>
<p>Generation Capacity Cost - Hybrid</p> <p>Participant Costs \$ 1,300 per participant</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p> <p>Based on reported measures installed by a comprehensive audit program in CA that included a direct installation component. Measures included T8s, LED exit signs, CFLs, programmable thermostats, HVAC tune-up measures, and vendor misers</p>
<p>Administrative Cost</p> <p>EK \$ 50,000 fixed annual, \$0 per new participant</p> <p>Co-op \$ 600 per new participant</p>	<p>Based on program tracking for the Commercial Lighting program. Consistent with survey of utility programs - includes setup, marketing, contractor relations, monitoring & eval, customer field work.</p> <p>This represents the cost of the audit as well as general administrative costs to implement the program.</p>
<p>Rate Schedule - Retail South Kentucky B rate.</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 300 new units per year (2012-2026), 15% free ridership</p>	<p>Based on achieving 1% penetration per year. coverage of commercial floorspace in 15 years. 1 unit = 2,600 square feet of treated space. Free rider based on updated study done by CA PUC DEER. Free rider is a participant who would have installed the measure anyway in the absence of the program.</p>
<p>Rebates</p> <p>Co-op to Participant \$1,300 per participant</p>	<p>This is a free audit and measures are installed during the audit. This rebate represents the fact that the coop pays for the cost of the measures that are installed</p>

Exhibit DSM-5

New Program Summary Sheets

Beat the Peak for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 4,072,917	Revenue Declines	(\$714,755)
Rebates From EK	\$0	Administrative Costs	\$0
		Rebates Paid To Consumers	\$0
Total Benefits	\$4,072,917	Total Costs	(\$714,755)
Benefit / Cost Ratio: 5.70			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$417,259	Up Front Investment	\$0
Rebates From Distribution System	\$ -		
Reductions in O&M costs	\$0		
Total Benefits	\$417,259	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$430,603	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$12,794,792	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$2,393,375	EK Administrative Costs	(\$5,639,001)
Reduced Customer O&M costs	\$0		
Total Benefits	\$15,618,770	Total Costs	(\$5,639,001)
Benefit / Cost Ratio: 2.77			

EK Benefits		EK Costs	
Avoided Energy Costs	\$430,603	Decrease In Revenue	(\$4,072,917)
Avoided Gen Capacity Costs	\$12,794,792	Rebates Paid	\$0
Avoided Transmission Expense	\$2,393,375	Administrative Costs	(\$5,639,001)
Total Benefits	\$15,618,770	Total Costs	(\$9,711,918)
Benefit / Cost Ratio: 1.61			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$502,623	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$14,863,190	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$2,771,463	EK Administrative Costs	(\$6,366,326)
Environmental Externalities	\$0		
Total Benefits	\$18,137,275	Total Costs	(\$6,366,326)
Benefit / Cost Ratio: 2.85			

Combined RIM:
Benefits: \$15,618,770 Costs: (\$6,353,756)

Benefit / Cost Ratio: 2.46

R 38 Energy Star Central A.C. for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 12,245,764	Revenue Declines	(\$15,881,329)
Rebates From EK	\$12,706,002	Administrative Costs	(\$5,520,366)
		Rebates Paid To Consumers	(\$6,312,358)
Total Benefits	\$24,951,765	Total Costs	(\$27,714,053)
Benefit / Cost Ratio: 0.90			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$7,809,098	Up Front Investment	(\$8,873,046)
Rebates From Distribution System	\$ 4,150,460		
Reductions in O&M costs	\$0		
Total Benefits	\$11,959,558	Total Costs	(\$8,873,046)
Benefit / Cost Ratio: 1.35			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$8,431,642	Up Front Customer Investment	(\$13,211,157)
Avoided Gen Capacity Costs	\$11,803,032	Distribution System Admin. Costs	(\$5,520,366)
Avoided Transmission Expense	\$1,747,937	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$21,982,610	Total Costs	(\$18,851,479)
Benefit / Cost Ratio: 1.17			

EK Benefits		EK Costs	
Avoided Energy Costs	\$8,431,642	Decrease In Revenue	(\$12,245,764)
Avoided Gen Capacity Costs	\$11,803,032	Rebates Paid	(\$12,706,002)
Avoided Transmission Expense	\$1,747,937	Administrative Costs	(\$119,956)
Total Benefits	\$21,982,610	Total Costs	(\$25,071,721)
Benefit / Cost Ratio: 0.88			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$10,126,130	Up Front Customer Investment	(\$14,657,822)
Avoided Gen Capacity Costs	\$14,516,375	Distribution System Admin. Costs	(\$6,054,405)
Avoided Transmission Expense	\$2,094,983	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$26,737,488	Total Costs	(\$20,843,787)
Benefit / Cost Ratio: 1.28			

Combined RIM:
Benefits: \$21,982,610 Costs: (\$27,834,008)

Benefit / Cost Ratio: 0.79

Geothermal Retrofit for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 6,050,700	Revenue Declines	(\$6,782,949)
Rebates From EK	\$1,896,204	Administrative Costs	(\$165,742)
		Rebates Paid To Consumers	(\$1,404,596)
Total Benefits	\$7,946,905	Total Costs	(\$8,353,286)
Benefit / Cost Ratio: 0.95			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$4,340,697	Up Front Investment	(\$3,184,366)
Rebates From Distribution System	\$ 1,256,986		
Reductions in O&M costs	\$0		
Total Benefits	\$5,597,684	Total Costs	(\$3,184,366)
Benefit / Cost Ratio: 1.76			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,523,564	Up Front Customer Investment	(\$3,558,309)
Avoided Gen Capacity Costs	\$4,913,846	Distribution System Admin. Costs	(\$165,742)
Avoided Transmission Expense	\$967,454	EK Administrative Costs	(\$23,410)
Reduced Customer O&M costs	\$0		
Total Benefits	\$9,404,863	Total Costs	(\$3,747,461)
Benefit / Cost Ratio: 2.51			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,523,564	Decrease In Revenue	(\$6,050,700)
Avoided Gen Capacity Costs	\$4,913,846	Rebates Paid	(\$1,896,204)
Avoided Transmission Expense	\$967,454	Administrative Costs	(\$23,410)
Total Benefits	\$9,404,863	Total Costs	(\$7,970,314)
Benefit / Cost Ratio: 1.18			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$3,982,790	Up Front Customer Investment	(\$3,657,969)
Avoided Gen Capacity Costs	\$5,545,086	Distribution System Admin. Costs	(\$170,384)
Avoided Transmission Expense	\$1,088,604	EK Administrative Costs	(\$24,066)
Environmental Externalities	\$0		
Total Benefits	\$10,616,480	Total Costs	(\$3,852,419)
Benefit / Cost Ratio: 2.76			

Combined RIM:
Benefits: \$9,404,863 Costs: (\$8,376,696)

Benefit / Cost Ratio: 1.12

**R50 Home Energy Information program for 2012 IRP with updated system lambda (2012)
for avoided energy costs**

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 21,823,080	Revenue Declines	(\$30,084,209)
Rebates From EK	\$8,396,906	Administrative Costs	\$0
		Rebates Paid To Consumers	\$0
Total Benefits	\$30,219,986	Total Costs	(\$30,084,209)
Benefit / Cost Ratio: 1.00			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$21,519,696	Up Front Investment	\$0
Rebates From Distribution System	\$ -		
Reductions in O&M costs	\$0		
Total Benefits	\$21,519,696	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$14,902,211	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$9,046,535	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$1,792,872	EK Administrative Costs	(\$14,644,696)
Reduced Customer O&M costs	\$0		
Total Benefits	\$25,741,618	Total Costs	(\$14,644,696)
Benefit / Cost Ratio: 1.76			

EK Benefits		EK Costs	
Avoided Energy Costs	\$14,902,211	Decrease In Revenue	(\$21,823,080)
Avoided Gen Capacity Costs	\$9,046,535	Rebates Paid	(\$8,396,906)
Avoided Transmission Expense	\$1,792,872	Administrative Costs	(\$14,644,696)
Total Benefits	\$25,741,618	Total Costs	(\$44,864,682)
Benefit / Cost Ratio: 0.57			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$16,376,501	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$9,954,690	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$1,962,803	EK Administrative Costs	(\$16,037,235)
Environmental Externalities	\$0		
Total Benefits	\$28,293,994	Total Costs	(\$16,037,235)
Benefit / Cost Ratio: 1.76			

Combined RIM:
Benefits: \$25,741,618 Costs: (\$44,728,905)

Benefit / Cost Ratio: 0.58

R02 Low Income Weatherization program: 2012 IRP with updated system lambda (2012) for energy avoided costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 45,880,500	Revenue Declines	(\$57,752,737)
Rebates From EK	\$47,682,431	Administrative Costs	(\$44,983,426)
		Rebates Paid To Consumers	\$0
Total Benefits	\$93,562,931	Total Costs	(\$102,736,163)
Benefit / Cost Ratio: 0.91			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$28,397,925	Up Front Investment	\$0
Rebates From Distribution System	\$ -		
Reductions in O&M costs	\$0		
Total Benefits	\$28,397,925	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$29,660,483	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$41,016,672	Distribution System Admin. Costs	(\$44,983,426)
Avoided Transmission Expense	\$6,951,502	EK Administrative Costs	(\$479,823)
Reduced Customer O&M costs	\$0		
Total Benefits	\$77,628,657	Total Costs	(\$45,463,249)
Benefit / Cost Ratio: 1.71			

EK Benefits		EK Costs	
Avoided Energy Costs	\$29,660,483	Decrease In Revenue	(\$45,880,500)
Avoided Gen Capacity Costs	\$41,016,672	Rebates Paid	(\$47,682,431)
Avoided Transmission Expense	\$6,951,502	Administrative Costs	(\$479,823)
Total Benefits	\$77,628,657	Total Costs	(\$94,042,754)
Benefit / Cost Ratio: 0.83			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$35,621,285	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$50,445,800	Distribution System Admin. Costs	(\$49,335,110)
Avoided Transmission Expense	\$8,331,695	EK Administrative Costs	(\$526,241)
Environmental Externalities	\$0		
Total Benefits	\$94,398,780	Total Costs	(\$49,861,351)
Benefit / Cost Ratio: 1.89			

Combined RIM:
Benefits: \$77,628,657 Costs: (\$103,215,986)

Benefit / Cost Ratio: 0.75

Mobile Home Retrofit for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 12,555,154	Revenue Declines	(\$16,358,563)
Rebates From EK	\$6,597,569	Administrative Costs	(\$1,499,448)
		Rebates Paid To Consumers	(\$4,198,453)
Total Benefits	\$19,152,723	Total Costs	(\$22,056,463)
Benefit / Cost Ratio: 0.87			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$8,809,205	Up Front Investment	(\$5,091,071)
Rebates From Distribution System	\$ 2,969,791		
Reductions in O&M costs	\$0		
Total Benefits	\$11,778,996	Total Costs	(\$5,091,071)
Benefit / Cost Ratio: 2.31			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$8,771,090	Up Front Customer Investment	(\$7,197,348)
Avoided Gen Capacity Costs	\$6,954,784	Distribution System Admin. Costs	(\$1,499,448)
Avoided Transmission Expense	\$1,344,240	EK Administrative Costs	(\$599,779)
Reduced Customer O&M costs	\$0		
Total Benefits	\$17,070,113	Total Costs	(\$9,296,575)
Benefit / Cost Ratio: 1.84			

EK Benefits		EK Costs	
Avoided Energy Costs	\$8,771,090	Decrease In Revenue	(\$12,555,154)
Avoided Gen Capacity Costs	\$6,954,784	Rebates Paid	(\$6,597,569)
Avoided Transmission Expense	\$1,344,240	Administrative Costs	(\$599,779)
Total Benefits	\$17,070,113	Total Costs	(\$19,752,502)
Benefit / Cost Ratio: 0.86			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$10,389,094	Up Front Customer Investment	(\$7,893,618)
Avoided Gen Capacity Costs	\$8,228,528	Distribution System Admin. Costs	(\$1,644,504)
Avoided Transmission Expense	\$1,582,193	EK Administrative Costs	(\$657,801)
Environmental Externalities	\$0		
Total Benefits	\$20,199,815	Total Costs	(\$10,195,923)
Benefit / Cost Ratio: 1.98			

Combined RIM:
Benefits: \$17,070,113 Costs: (\$22,656,242)

Benefit / Cost Ratio: 0.75

Programmable Thermostat for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 2,119,333	Revenue Declines	(\$3,442,593)
Rebates From EK	\$755,722	Administrative Costs	(\$107,960)
		Rebates Paid To Consumers	(\$359,867)
Total Benefits	\$2,875,055	Total Costs	(\$3,910,421)
Benefit / Cost Ratio: 0.74			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$1,946,266	Up Front Investment	(\$468,379)
Rebates From Distribution System	\$ 254,554		
Reductions in O&M costs	\$0		
Total Benefits	\$2,200,819	Total Costs	(\$468,379)
Benefit / Cost Ratio: 4.70			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$1,848,971	Up Front Customer Investment	(\$662,156)
Avoided Gen Capacity Costs	\$465,022	Distribution System Admin. Costs	(\$107,960)
Avoided Transmission Expense	\$78,457	EK Administrative Costs	(\$59,978)
Reduced Customer O&M costs	\$0		
Total Benefits	\$2,392,450	Total Costs	(\$830,094)
Benefit / Cost Ratio: 2.88			

EK Benefits		EK Costs	
Avoided Energy Costs	\$1,848,971	Decrease In Revenue	(\$2,119,333)
Avoided Gen Capacity Costs	\$465,022	Rebates Paid	(\$755,722)
Avoided Transmission Expense	\$78,457	Administrative Costs	(\$59,978)
Total Benefits	\$2,392,450	Total Costs	(\$2,935,033)
Benefit / Cost Ratio: 0.82			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$2,162,780	Up Front Customer Investment	(\$726,213)
Avoided Gen Capacity Costs	\$541,757	Distribution System Admin. Costs	(\$118,404)
Avoided Transmission Expense	\$91,201	EK Administrative Costs	(\$65,780)
Environmental Externalities	\$0		
Total Benefits	\$2,795,739	Total Costs	(\$910,397)
Benefit / Cost Ratio: 3.07			

Combined RIM:
Benefits: \$2,392,450 Costs: (\$3,970,398)

Benefit / Cost Ratio: 0.60

Residential DLC of pool pumps for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 2,102,935	Revenue Declines	(\$171,541)
Rebates From EK	\$2,083,272	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$2,083,272)
Total Benefits	\$4,186,208	Total Costs	(\$2,254,813)
Benefit / Cost Ratio: 1.86			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$100,142	Up Front Investment	\$0
Rebates From Distribution System	\$ 1,197,764		
Reductions in O&M costs	\$0		
Total Benefits	\$1,297,906	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$107,727	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$4,947,986	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$841,421	EK Administrative Costs	(\$2,634,135)
Reduced Customer O&M costs	\$0		
Total Benefits	\$5,897,134	Total Costs	(\$2,634,135)
Benefit / Cost Ratio: 2.24			

EK Benefits		EK Costs	
Avoided Energy Costs	\$107,727	Decrease In Revenue	(\$2,102,935)
Avoided Gen Capacity Costs	\$4,947,986	Rebates Paid	(\$2,083,272)
Avoided Transmission Expense	\$841,421	Administrative Costs	(\$2,634,135)
Total Benefits	\$5,897,134	Total Costs	(\$6,820,342)
Benefit / Cost Ratio: 0.86			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$125,744	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$5,747,874	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$974,342	EK Administrative Costs	(\$2,870,771)
Environmental Externalities	\$0		
Total Benefits	\$6,847,961	Total Costs	(\$2,870,771)
Benefit / Cost Ratio: 2.39			

Combined RIM:
Benefits: \$5,897,134 Costs: (\$4,888,948)

Benefit / Cost Ratio: 1.21

Advanced Weatherization Tier 2 for 2012 IRP with updated system lambda (2012) for
avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 5,174,735	Revenue Declines	(\$6,940,590)
Rebates From EK	\$3,287,632	Administrative Costs	(\$730,059)
		Rebates Paid To Consumers	(\$1,655,642)
Total Benefits	\$8,462,367	Total Costs	(\$9,326,291)
Benefit / Cost Ratio: 0.91			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$3,208,664	Up Front Investment	(\$3,153,409)
Rebates From Distribution System	\$ 1,107,125		
Reductions in O&M costs	\$0		
Total Benefits	\$4,315,789	Total Costs	(\$3,153,409)
Benefit / Cost Ratio: 1.37			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,571,908	Up Front Customer Investment	(\$4,715,741)
Avoided Gen Capacity Costs	\$4,436,175	Distribution System Admin. Costs	(\$730,059)
Avoided Transmission Expense	\$742,940	EK Administrative Costs	\$0
Reduced Customer O&M costs	\$0		
Total Benefits	\$8,751,023	Total Costs	(\$5,445,800)
Benefit / Cost Ratio: 1.61			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,571,908	Decrease In Revenue	(\$5,174,735)
Avoided Gen Capacity Costs	\$4,436,175	Rebates Paid	(\$3,287,632)
Avoided Transmission Expense	\$742,940	Administrative Costs	\$0
Total Benefits	\$8,751,023	Total Costs	(\$8,462,367)
Benefit / Cost Ratio: 1.03			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$4,337,307	Up Front Customer Investment	(\$5,233,225)
Avoided Gen Capacity Costs	\$5,523,161	Distribution System Admin. Costs	(\$810,173)
Avoided Transmission Expense	\$901,291	EK Administrative Costs	\$0
Environmental Externalities	\$0		
Total Benefits	\$10,761,758	Total Costs	(\$6,043,398)
Benefit / Cost Ratio: 1.78			

Combined RIM:
Benefits: \$8,751,023 Costs: (\$9,326,291)

Benefit / Cost Ratio: 0.94

Advanced Weatherization Tier 3 for 2012 IRP with updated system lambda (2012) for
avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 4,599,764	Revenue Declines	(\$6,169,413)
Rebates From EK	\$2,759,403	Administrative Costs	(\$486,706)
		Rebates Paid To Consumers	(\$1,471,682)
Total Benefits	\$7,359,167	Total Costs	(\$8,127,801)
Benefit / Cost Ratio: 0.91			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$2,852,145	Up Front Investment	(\$2,802,608)
Rebates From Distribution System	\$ 984,111		
Reductions in O&M costs	\$0		
Total Benefits	\$3,836,257	Total Costs	(\$2,802,608)
Benefit / Cost Ratio: 1.37			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,175,029	Up Front Customer Investment	(\$4,191,139)
Avoided Gen Capacity Costs	\$3,943,267	Distribution System Admin. Costs	(\$486,706)
Avoided Transmission Expense	\$660,391	EK Administrative Costs	\$0
Reduced Customer O&M costs	\$0		
Total Benefits	\$7,778,687	Total Costs	(\$4,677,845)
Benefit / Cost Ratio: 1.66			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,175,029	Decrease In Revenue	(\$4,599,764)
Avoided Gen Capacity Costs	\$3,943,267	Rebates Paid	(\$2,759,403)
Avoided Transmission Expense	\$660,391	Administrative Costs	\$0
Total Benefits	\$7,778,687	Total Costs	(\$7,359,167)
Benefit / Cost Ratio: 1.06			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$3,855,384	Up Front Customer Investment	(\$4,651,056)
Avoided Gen Capacity Costs	\$4,909,476	Distribution System Admin. Costs	(\$540,115)
Avoided Transmission Expense	\$801,147	EK Administrative Costs	\$0
Environmental Externalities	\$0		
Total Benefits	\$9,566,007	Total Costs	(\$5,191,171)
Benefit / Cost Ratio: 1.84			

Combined RIM:
Benefits: \$7,778,687 Costs: (\$8,127,801)

Benefit / Cost Ratio: 0.96

R 20 Energy Star Clothes Washer for 2012 IRP with updated system lambda (2012) for
avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 4,874,665	Revenue Declines	(\$7,245,158)
Rebates From EK	\$2,268,664	Administrative Costs	(\$400,352)
		Rebates Paid To Consumers	(\$1,334,508)
Total Benefits	\$7,143,329	Total Costs	(\$8,980,019)
Benefit / Cost Ratio: 0.80			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$5,900,524	Up Front Investment	(\$4,417,777)
Rebates From Distribution System	\$ 943,969		
Reductions in O&M costs	\$1,998,954		
Total Benefits	\$8,843,447	Total Costs	(\$4,417,777)
Benefit / Cost Ratio: 2.00			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,831,370	Up Front Customer Investment	(\$6,245,499)
Avoided Gen Capacity Costs	\$1,358,267	Distribution System Admin. Costs	(\$400,352)
Avoided Transmission Expense	\$258,004	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$1,998,954		
Total Benefits	\$7,446,595	Total Costs	(\$6,765,807)
Benefit / Cost Ratio: 1.10			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,831,370	Decrease In Revenue	(\$4,874,665)
Avoided Gen Capacity Costs	\$1,358,267	Rebates Paid	(\$2,268,664)
Avoided Transmission Expense	\$258,004	Administrative Costs	(\$119,956)
Total Benefits	\$5,447,641	Total Costs	(\$7,263,285)
Benefit / Cost Ratio: 0.75			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$4,538,143	Up Front Customer Investment	(\$6,849,687)
Avoided Gen Capacity Costs	\$1,607,029	Distribution System Admin. Costs	(\$439,082)
Avoided Transmission Expense	\$303,675	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Reduced Customer O&M costs	\$ 1,998,954		
Total Benefits	\$8,447,801	Total Costs	(\$7,420,329)
Benefit / Cost Ratio: 1.14			

Combined RIM:
Benefits: \$5,447,641 Costs: (\$9,099,975)

Benefit / Cost Ratio: 0.60

I3 C&I Demand Response for 2012 IRP with updated system lambda (2012) for avoided energy costs; blended retail rate

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 14,774,652	Revenue Declines	(\$18,548,931)
Rebates From EK	\$11,362,498	Administrative Costs	(\$3,587,301)
		Rebates Paid To Consumers	(\$7,775,197)
Total Benefits	\$26,137,150	Total Costs	(\$29,911,428)
Benefit / Cost Ratio: 0.87			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$11,439,530	Up Front Investment	(\$4,628,147)
Rebates From Distribution System	\$ 4,800,154		
Reductions in O&M costs	\$0		
Total Benefits	\$16,239,684	Total Costs	(\$4,628,147)
Benefit / Cost Ratio: 3.51			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,918,034	Up Front Customer Investment	(\$7,464,840)
Avoided Gen Capacity Costs	\$28,742,223	Distribution System Admin. Costs	(\$3,587,301)
Avoided Transmission Expense	\$5,444,285	EK Administrative Costs	(\$942,006)
Reduced Customer O&M costs	\$0		
Total Benefits	\$38,104,542	Total Costs	(\$11,994,147)
Benefit / Cost Ratio: 3.18			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,918,034	Decrease In Revenue	(\$14,774,652)
Avoided Gen Capacity Costs	\$28,742,223	Rebates Paid	(\$11,362,498)
Avoided Transmission Expense	\$5,444,285	Administrative Costs	(\$942,006)
Total Benefits	\$38,104,542	Total Costs	(\$27,079,156)
Benefit / Cost Ratio: 1.41			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$4,509,609	Up Front Customer Investment	(\$8,517,094)
Avoided Gen Capacity Costs	\$32,972,701	Distribution System Admin. Costs	(\$4,111,388)
Avoided Transmission Expense	\$6,219,629	EK Administrative Costs	(\$1,055,573)
Environmental Externalities	\$0		
Total Benefits	\$43,701,939	Total Costs	(\$13,684,055)
Benefit / Cost Ratio: 3.19			

Combined RIM:
Benefits: \$38,104,542 Costs: (\$30,853,435)

Benefit / Cost Ratio: 1.24

I5 Industrial Process for 2012 IRP with updated system lambda (2012) for avoided energy costs. Rebates and transfer payments earlier lowered to bring all RIMs to 1.

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 48,019,280	Revenue Declines	(\$60,714,305)
Rebates From EK	\$14,214,762	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$1,439,470)
Total Benefits	\$62,234,042	Total Costs	(\$62,153,775)
Benefit / Cost Ratio: 1.00			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$34,324,756	Up Front Investment	(\$21,368,752)
Rebates From Distribution System	\$ 1,018,214		
Reductions in O&M costs	\$0		
Total Benefits	\$35,342,970	Total Costs	(\$21,368,752)
Benefit / Cost Ratio: 1.65			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$29,378,683	Customer Investment	(\$30,209,429)
Avoided Gen Capacity Costs	\$25,983,912	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$4,810,167	EK Administrative Costs	(\$5,685,905)
Reduced Customer O&M costs	\$0		
Total Benefits	\$60,172,763	Total Costs	(\$35,895,334)
Benefit / Cost Ratio: 1.68			

EK Benefits		EK Costs	
Avoided Energy Costs	\$29,378,683	Decrease In Revenue	(\$48,019,280)
Avoided Gen Capacity Costs	\$25,983,912	Rebates Paid	(\$14,214,762)
Avoided Transmission Expense	\$4,810,167	Administrative Costs	(\$5,685,905)
Total Benefits	\$60,172,763	Total Costs	(\$67,919,947)
Benefit / Cost Ratio: 0.89			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$34,364,856	Up Front Customer Investment	(\$33,131,881)
Avoided Gen Capacity Costs	\$30,271,654	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$5,591,493	EK Administrative Costs	(\$6,235,958)
Environmental Externalities	\$0		
Total Benefits	\$70,228,003	Total Costs	(\$39,367,839)
Benefit / Cost Ratio: 1.78			

Combined RIM:
Benefits: \$60,172,763 Costs: (\$67,839,680)

Benefit / Cost Ratio: 0.89

I2 Industrial Variable Speed Drives for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 32,049,705	Revenue Declines	(\$46,070,347)
Rebates From EK	\$10,998,747	Administrative Costs	(\$9,536)
		Rebates Paid To Consumers	(\$3,178,829)
Total Benefits	\$43,048,453	Total Costs	(\$49,258,712)
Benefit / Cost Ratio: 0.87			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$22,653,511	Up Front Investment	(\$8,314,037)
Rebates From Distribution System	\$ 2,248,556		
Reductions in O&M costs	\$0		
Total Benefits	\$24,902,067	Total Costs	(\$8,314,037)
Benefit / Cost Ratio: 3.00			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$24,636,261	Customer Investment	(\$11,753,719)
Avoided Gen Capacity Costs	\$7,837,240	Distribution System Admin. Costs	(\$9,536)
Avoided Transmission Expense	\$1,256,781	EK Administrative Costs	(\$239,912)
Reduced Customer O&M costs	\$0		
Total Benefits	\$33,730,282	Total Costs	(\$12,003,167)
Benefit / Cost Ratio: 2.81			

EK Benefits		EK Costs	
Avoided Energy Costs	\$24,636,261	Decrease In Revenue	(\$32,049,705)
Avoided Gen Capacity Costs	\$7,837,240	Rebates Paid	(\$10,998,747)
Avoided Transmission Expense	\$1,256,781	Administrative Costs	(\$239,912)
Total Benefits	\$33,730,282	Total Costs	(\$43,288,365)
Benefit / Cost Ratio: 0.78			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$29,587,356	Up Front Customer Investment	(\$12,890,771)
Avoided Gen Capacity Costs	\$9,638,906	Distribution System Admin. Costs	(\$10,459)
Avoided Transmission Expense	\$1,506,310	EK Administrative Costs	(\$263,121)
Environmental Externalities	\$0		
Total Benefits	\$40,732,572	Total Costs	(\$13,164,350)
Benefit / Cost Ratio: 3.09			

Combined RIM:
Benefits: \$33,730,282 Costs: (\$49,498,624)

Benefit / Cost Ratio: 0.68

Commercial EMS for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 13,068,688	Revenue Declines	(\$22,448,021)
Rebates From EK	\$6,477,613	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$5,398,011)
Total Benefits	\$19,546,301	Total Costs	(\$27,846,032)
Benefit / Cost Ratio: 0.70			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$11,038,043	Up Front Investment	(\$6,872,946)
Rebates From Distribution System	\$ 3,818,303		
Reductions in O&M costs	\$0		
Total Benefits	\$14,856,347	Total Costs	(\$6,872,946)
Benefit / Cost Ratio: 2.16			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$9,811,182	Up Front Customer Investment	(\$9,716,420)
Avoided Gen Capacity Costs	\$4,782,766	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$805,901	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$15,399,849	Total Costs	(\$9,836,376)
Benefit / Cost Ratio: 1.57			

EK Benefits		EK Costs	
Avoided Energy Costs	\$9,811,182	Decrease In Revenue	(\$13,068,688)
Avoided Gen Capacity Costs	\$4,782,766	Rebates Paid	(\$6,477,613)
Avoided Transmission Expense	\$805,901	Administrative Costs	(\$119,956)
Total Benefits	\$15,399,849	Total Costs	(\$19,666,257)
Benefit / Cost Ratio: 0.78			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$11,782,913	Up Front Customer Investment	(\$10,656,384)
Avoided Gen Capacity Costs	\$5,882,254	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$965,909	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$18,631,076	Total Costs	(\$10,787,944)
Benefit / Cost Ratio: 1.73			

Combined RIM:
Benefits: \$15,399,849 Costs: (\$27,965,988)

Benefit / Cost Ratio: 0.55

DLC of Commercial Central Air for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 4,118,169	Revenue Declines	(\$227,425)
Rebates From EK	\$3,333,236	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$3,333,236)
Total Benefits	\$7,451,405	Total Costs	(\$3,560,660)
Benefit / Cost Ratio: 2.09			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$132,766	Up Front Investment	\$0
Rebates From Distribution System	\$ 1,916,423		
Reductions in O&M costs	\$0		
Total Benefits	\$2,049,188	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$132,353	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$10,555,704	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$1,795,031	EK Administrative Costs	(\$3,314,302)
Reduced Customer O&M costs	\$0		
Total Benefits	\$12,483,088	Total Costs	(\$3,314,302)
Benefit / Cost Ratio: 3.77			

EK Benefits		EK Costs	
Avoided Energy Costs	\$132,353	Decrease In Revenue	(\$4,118,169)
Avoided Gen Capacity Costs	\$10,555,704	Rebates Paid	(\$3,333,236)
Avoided Transmission Expense	\$1,795,031	Administrative Costs	(\$3,314,302)
Total Benefits	\$12,483,088	Total Costs	(\$10,765,706)
Benefit / Cost Ratio: 1.16			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$154,489	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$12,262,132	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$2,078,597	EK Administrative Costs	(\$3,661,158)
Environmental Externalities	\$0		
Total Benefits	\$14,495,218	Total Costs	(\$3,661,158)
Benefit / Cost Ratio: 3.96			

Combined RIM:
Benefits: \$12,483,088 Costs: (\$6,874,962)

Benefit / Cost Ratio: 1.82

**Commercial Building Performance for 2012 IRP with updated system lambda (2012) for
avoided energy costs**

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 16,613,126	Revenue Declines	(\$24,836,998)
Rebates From EK	\$10,213,037	Administrative Costs	(\$1,360,299)
		Rebates Paid To Consumers	(\$6,639,554)
Total Benefits	\$26,826,163	Total Costs	(\$32,836,851)
Benefit / Cost Ratio: 0.82			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$15,092,207	Up Front Investment	(\$8,923,375)
Rebates From Distribution System	\$ 4,696,513		
Reductions in O&M costs	\$0		
Total Benefits	\$19,788,720	Total Costs	(\$8,923,375)
Benefit / Cost Ratio: 2.22			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$11,211,352	Up Front Customer Investment	(\$12,615,152)
Avoided Gen Capacity Costs	\$6,983,932	Distribution System Admin. Costs	(\$1,360,299)
Avoided Transmission Expense	\$1,309,674	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$19,504,958	Total Costs	(\$14,095,406)
Benefit / Cost Ratio: 1.38			

EK Benefits		EK Costs	
Avoided Energy Costs	\$11,211,352	Decrease In Revenue	(\$16,613,126)
Avoided Gen Capacity Costs	\$6,983,932	Rebates Paid	(\$10,213,037)
Avoided Transmission Expense	\$1,309,674	Administrative Costs	(\$119,956)
Total Benefits	\$19,504,958	Total Costs	(\$26,946,119)
Benefit / Cost Ratio: 0.72			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$12,849,605	Up Front Customer Investment	(\$13,835,538)
Avoided Gen Capacity Costs	\$7,982,952	Distribution System Admin. Costs	(\$1,491,894)
Avoided Transmission Expense	\$1,493,329	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$22,325,886	Total Costs	(\$15,458,992)
Benefit / Cost Ratio: 1.44			

Combined RIM:
Benefits: \$19,504,958 Costs: (\$32,956,807)

Benefit / Cost Ratio: 0.59

Commercial Duct Sealing for 2012 IRP with updated system lambda (2012) for avoided energy costs

<u>Distribution System Benefits</u>		<u>Distribution System Costs</u>	
Power Bill Declines	\$ 19,171,845	Revenue Declines	(\$31,177,807)
Rebates From EK	\$13,555,006	Administrative Costs	(\$4,534,329)
		Rebates Paid To Consumers	(\$7,497,238)
Total Benefits	\$32,726,850	Total Costs	(\$43,209,374)
Benefit / Cost Ratio: 0.76			

<u>Participant Benefits</u>		<u>Participant Costs</u>	
Electric Bill Declines	\$15,330,616	Up Front Investment	(\$9,545,758)
Rebates From Distribution System	\$ 5,303,199		
Reductions in O&M costs	\$0		
Total Benefits	\$20,633,815	Total Costs	(\$9,545,758)
Benefit / Cost Ratio: 2.16			

<u>Total Resource Benefits</u>		<u>Total Resource Costs</u>	
Avoided Energy Costs	\$13,626,641	Up Front Customer Investment	(\$13,495,028)
Avoided Gen Capacity Costs	\$9,490,833	Distribution System Admin. Costs	(\$4,534,329)
Avoided Transmission Expense	\$1,551,779	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$24,669,253	Total Costs	(\$18,149,313)
Benefit / Cost Ratio: 1.36			

<u>EK Benefits</u>		<u>EK Costs</u>	
Avoided Energy Costs	\$13,626,641	Decrease In Revenue	(\$19,171,845)
Avoided Gen Capacity Costs	\$9,490,833	Rebates Paid	(\$13,555,006)
Avoided Transmission Expense	\$1,551,779	Administrative Costs	(\$119,956)
Total Benefits	\$24,669,253	Total Costs	(\$32,846,806)
Benefit / Cost Ratio: 0.75			

<u>Societal Benefits</u>		<u>Societal Costs</u>	
Avoided Energy Costs	\$16,365,158	Up Front Customer Investment	(\$14,800,533)
Avoided Gen Capacity Costs	\$11,672,635	Distribution System Admin. Costs	(\$4,972,979)
Avoided Transmission Expense	\$1,859,879	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$29,897,672	Total Costs	(\$19,905,072)
Benefit / Cost Ratio: 1.50			

Combined RIM:
Benefits: \$24,669,253 Costs: (\$43,329,330)

Benefit / Cost Ratio: 0.57

Commercial HVAC for 2012 IRP with updated system lambda (2012) for avoided energy costs

<u>Distribution System Benefits</u>		<u>Distribution System Costs</u>	
Power Bill Declines	\$ 9,651,069	Revenue Declines	(\$16,132,644)
Rebates From EK	\$4,942,179	Administrative Costs	(\$1,698,574)
		Rebates Paid To Consumers	(\$2,591,045)
Total Benefits	\$14,593,248	Total Costs	(\$20,422,264)
Benefit / Cost Ratio: 0.71			

<u>Participant Benefits</u>		<u>Participant Costs</u>	
Electric Bill Declines	\$7,932,674	Up Front Investment	(\$2,895,853)
Rebates From Distribution System	\$ 1,832,786		
Reductions in O&M costs	\$0		
Total Benefits	\$9,765,459	Total Costs	(\$2,895,853)
Benefit / Cost Ratio: 3.37			

<u>Total Resource Benefits</u>		<u>Total Resource Costs</u>	
Avoided Energy Costs	\$7,051,507	Up Front Customer Investment	(\$4,225,303)
Avoided Gen Capacity Costs	\$4,682,807	Distribution System Admin. Costs	(\$1,698,574)
Avoided Transmission Expense	\$782,959	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$12,517,273	Total Costs	(\$6,043,833)
Benefit / Cost Ratio: 2.07			

<u>EK Benefits</u>		<u>EK Costs</u>	
Avoided Energy Costs	\$7,051,507	Decrease In Revenue	(\$9,651,069)
Avoided Gen Capacity Costs	\$4,682,807	Rebates Paid	(\$4,942,179)
Avoided Transmission Expense	\$782,959	Administrative Costs	(\$119,956)
Total Benefits	\$12,517,273	Total Costs	(\$14,713,204)
Benefit / Cost Ratio: 0.85			

<u>Societal Benefits</u>		<u>Societal Costs</u>	
Avoided Energy Costs	\$8,468,633	Up Front Customer Investment	(\$4,667,264)
Avoided Gen Capacity Costs	\$5,759,315	Distribution System Admin. Costs	(\$1,862,894)
Avoided Transmission Expense	\$938,412	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$15,166,360	Total Costs	(\$6,661,718)
Benefit / Cost Ratio: 2.28			

Combined RIM:
Benefits: \$12,517,273 Costs: (\$20,542,220)

Benefit / Cost Ratio: 0.61

Commercial New Construction for 2012 IRP with updated system lambda (2012) for avoided energy costs

<u>Distribution System Benefits</u>		<u>Distribution System Costs</u>	
Power Bill Declines	\$ 53,842,855	Revenue Declines	(\$108,473,170)
Rebates From EK	\$14,778,555	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$11,083,916)
Total Benefits	\$68,621,410	Total Costs	(\$119,557,086)
Benefit / Cost Ratio: 0.57			

<u>Participant Benefits</u>		<u>Participant Costs</u>	
Electric Bill Declines	\$44,933,561	Up Front Investment	(\$14,112,449)
Rebates From Distribution System	\$ 7,840,249		
Reductions in O&M costs	\$0		
Total Benefits	\$52,773,810	Total Costs	(\$14,112,449)
Benefit / Cost Ratio: 3.74			

<u>Total Resource Benefits</u>		<u>Total Resource Costs</u>	
Avoided Energy Costs	\$38,718,356	Up Front Customer Investment	(\$19,951,049)
Avoided Gen Capacity Costs	\$38,164,666	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$4,475,198	EK Administrative Costs	(\$119,956)
Reduced Customer O&M costs	\$0		
Total Benefits	\$81,358,219	Total Costs	(\$20,071,005)
Benefit / Cost Ratio: 4.05			

<u>EK Benefits</u>		<u>EK Costs</u>	
Avoided Energy Costs	\$38,718,356	Decrease In Revenue	(\$53,842,855)
Avoided Gen Capacity Costs	\$38,164,666	Rebates Paid	(\$14,778,555)
Avoided Transmission Expense	\$4,475,198	Administrative Costs	(\$119,956)
Total Benefits	\$81,358,219	Total Costs	(\$68,741,366)
Benefit / Cost Ratio: 1.18			

<u>Societal Benefits</u>		<u>Societal Costs</u>	
Avoided Energy Costs	\$47,193,882	Up Front Customer Investment	(\$21,881,108)
Avoided Gen Capacity Costs	\$50,522,486	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$5,519,825	EK Administrative Costs	(\$131,560)
Environmental Externalities	\$0		
Total Benefits	\$103,236,193	Total Costs	(\$22,012,668)
Benefit / Cost Ratio: 4.69			

Combined RIM:
Benefits: \$81,358,219 Costs: (\$119,677,042)

Benefit / Cost Ratio: 0.68

C6 Small C&I Audit for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 7,115,169	Revenue Declines	(\$10,637,339)
Rebates From EK	\$7,917,083	Administrative Costs	(\$2,159,204)
		Rebates Paid To Consumers	(\$4,678,276)
Total Benefits	\$15,032,252	Total Costs	(\$17,474,819)
Benefit / Cost Ratio: 0.86			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$6,013,806	Up Front Investment	(\$2,812,817)
Rebates From Distribution System	\$ 3,309,196		
Reductions in O&M costs	\$0		
Total Benefits	\$9,323,002	Total Costs	(\$2,812,817)
Benefit / Cost Ratio: 3.31			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$4,910,368	Up Front Customer Investment	(\$3,976,535)
Avoided Gen Capacity Costs	\$3,010,694	Distribution System Admin. Costs	(\$2,159,204)
Avoided Transmission Expense	\$560,817	EK Administrative Costs	(\$599,779)
Reduced Customer O&M costs	\$0		
Total Benefits	\$8,481,879	Total Costs	(\$6,735,518)
Benefit / Cost Ratio: 1.26			

EK Benefits		EK Costs	
Avoided Energy Costs	\$4,910,368	Decrease In Revenue	(\$7,115,169)
Avoided Gen Capacity Costs	\$3,010,694	Rebates Paid	(\$7,917,083)
Avoided Transmission Expense	\$560,817	Administrative Costs	(\$599,779)
Total Benefits	\$8,481,879	Total Costs	(\$15,632,031)
Benefit / Cost Ratio: 0.54			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$5,743,760	Up Front Customer Investment	(\$4,361,224)
Avoided Gen Capacity Costs	\$3,507,504	Distribution System Admin. Costs	(\$2,368,085)
Avoided Transmission Expense	\$651,911	EK Administrative Costs	(\$657,801)
Environmental Externalities	\$0		
Total Benefits	\$9,903,175	Total Costs	(\$7,387,110)
Benefit / Cost Ratio: 1.34			

Combined RIM:
Benefits: \$8,481,879 Costs: (\$18,074,598)

Benefit / Cost Ratio: 0.47

Exhibit DSM-6

Existing Programs Description, Assumption and Summary Sheets

Program Descriptions for Existing DSM Programs

Introduction

For over 20 years, EKPC and its 16 member systems have promoted the cost-effective use of energy by offering conservation and other marketing programs to the retail customer. These programs were designed to meet the needs of the customer, and to delay the need for additional generating capacity.

This document describes the existing DSM programs. These programs are implemented and administered by the member distribution systems. EKPC supports the member systems with analysis, promotional material, incentives, and other support services. EKPC considers the programs as part of its overall supply portfolio, with the understanding that the programs impact EKPC indirectly, through its member systems.

Current DSM programs offered by EKPC's member systems which are being treated as Existing programs in this IRP are listed below and described in this exhibit:

- Button-up Weatherization Program (Residential)
- Button-up Weatherization Program with Air Sealing (Residential)
- Air-Source Heat Pump Retrofit Program (Residential)
- Electric Thermal Storage Incentive Program (Residential)
- Direct Load Control of Air Conditioners and Water Heaters (Residential)
- Residential Lighting (Residential)
- Touchstone Energy Program (Residential)
- Touchstone Energy Manufactured Home Program (Residential)
- Tune-Up HVAC Maintenance Program (Residential)
- Commercial Lighting Program (Commercial)
- Compressed Air Program (Industrial)
- Gallatin Steel Interruptible (Industrial)
- Other Interruptible (Industrial)

Button-Up Weatherization Program

Program Description

The program requires the installation of insulation materials or the use of other weatherization techniques to reduce heat loss in the home. Any retail member who resides in a stick-built or manufactured home that is at least two years old and uses electricity as the primary source for space heat is eligible. In the future, EKPC expects to redesign its residential weatherization offering to a wholistic approach with multiple tiers. The Button-Up program would be provided in the first tier.

Target Markets

The primary program targets single-family older homes or manufactured homes. Home must be 2 years old or older to qualify for the incentive.

Button-Up Weatherization with Air Sealing Program

Program Description

The program requires the installation of insulation materials or the use of other weatherization techniques to reduce heat loss in the home. Any retail member who resides in a stick-built or manufactured home that is at least two years old and uses electricity as the primary source for space heat is eligible. In addition to the Button-Up program, EKPC offers an option to also seal the envelope of the home. A blower door test will be required to demonstrate the impact in kW demand reduction. An added incentive will be paid based on that reduction, In the future, EKPC expects to redesign its residential weatherization offering to a wholistic approach with multiple tiers. The Button-Up program would be provided in the first tier.

Target Markets

The primary program targets single-family older homes or manufactured homes. Home must be 2 years old or older to qualify for the incentive.

Air Source Heat Pump Retrofit Program

Program Description

This program provides incentives for residential customers to replace their existing resistance heat source with a high efficiency air source heat pump. Homeowners applying for this incentive must install an air source heat pump that is the equivalent to 13 SEER and 7.5 HSPF or higher for manufactured homes, and 14 SEER and 8.2 HSPF for stick built homes. The existing heating system must be 2 years or older to qualify for incentives.

Target Markets

The primary targets for this program are retail members who currently heat their home with a resistance heat source. Incentives are offered when the homeowner's primary source of heat is an electric resistance furnace, ceiling cable heat, or baseboard heat. This program is targeted at both stick built and manufactured homes.

Electric Thermal Storage Incentive Program

Program Description

Electric Thermal Storage provides retail members with a cost-efficient means of using electricity for space heating. A discounted rate for ETS energy encourages retail members to use electricity for heating during off peak hours. This improves the utility's load factor, reduces energy costs for the retail member, and delays the need for new peak load capacity expenses. Since the ETS technology is designed primarily to save kW on peak days, it can also be treated as a demand response program. EKPC will be exploring the advantages and disadvantages of treating ETS as a demand response program instead of a discounted rate program.

Target Market

The incentives are available to any retail member, but are primarily designed for retail members who currently use electricity (including heat pumps, baseboard, ceiling cable, or electric furnace heating systems) as their primary source for space heating. Two exceptions (wood burning heat source and propane) will also be allowed due to the niche demographic of ETS and to the fact that ETS consumes electricity during off-peak times.

Direct Load Control of Residential Air Conditioners and Water Heaters Program

Program Description

The objective of the program is to reduce peak demand and energy usage through the installation of load control devices on residential air conditioners and electric water heaters. The priority appliance is the central air conditioner, and homes with central air conditioning will be targeted by marketing efforts.

Peak demand reduction is accomplished by cycling equipment on and off according to a predetermined control strategy. Central air conditioning and heat pump units are cycled on and off, while water heater loads are curtailed. The typical control duration is four hours. Participating customers receive an annual bill credit incentive.

EKPC plans to continue to rely on a third party administrator to provide enrollment, installation, service calls, and measurement & verification services.

EKPC offers an incentive of \$10 per year for each water heater under control, and \$20 per year for each air conditioner being controlled by a switch. The air conditioner incentive consists of \$5 per month bill credits during four hot weather months.

EKPC has a goal of enrolling 45,000 homes that contribute a total 50,000 air conditioners and 27,000 water heaters over the next seven years. The participation goal represents a cumulative penetration of 16% of the current eligible market of residences with central air conditioning.

Target Markets

The primary program targets are homes with central air conditioning (including heat pumps or electric water heaters). The incentive is available to any residential retail member of a participating EKPC cooperative who has a qualifying central air conditioner and/or qualifying electric water heaters. Qualifying water heaters must have a minimum capacity of 40 gallons in order to ensure that the interruption does not affect customer comfort.

Residential Efficient Lighting with Retailers Program

Program Description

The purpose of this program is to transform the market for residential lighting by facilitating a shift in consumer purchasing decisions from market baseline efficiency to higher efficiency lighting products. The program is designed to enter into a partnership with the retail establishments that provide residential lighting products in our service territory. EKPC will sponsor aggressive marketing and promotion activities designed to educate the customer, and will establish and nurture partnerships with key retailers including the development of point of sale marketing materials. It is expected that retailers will develop their own marketing materials as well as sponsor local advertising initiatives. EKPC will underwrite certain discounts and incentives for compact fluorescent and LED light bulbs that are sold to residential members of EKPC distribution cooperatives according to agreements and procedures established between EKPC and the retailers.

Target Markets

The program is targeted to all residential members.

Tune-Up HVAC with Duct Sealing Program

Program Description

This program offers the follow measures:

- Cleaning indoor and outdoor heat exchanger coils
- Changing filters
- Measuring the temperature differential across the indoor coil to determine proper compressor operation
- Checking the thermostat to verify operation and proper staging
- Sealing the ductwork, either through traditional mastic sealers or with the *Aeroseal* duct sealing program.

Duct loss measurement requires the use of a blower door test (before and after the duct sealing work is performed). Duct leakage per system must be reduced to below 10% of the fan's rated capacity. All joints in the duct system must be sealed with foil tape and mastic. Only contractors trained or approved by EKPC may be used.

In the future, EKPC expects to redesign its residential weatherization offering to a wholistic approach with multiple tiers. The Tune-Up program would be provided in the first tier.

Target Markets

The program is targeted to single-family homes using electric furnaces or electric heat pumps that have exhibited high energy use. All facilities must have duct systems that are at least two years old to qualify for incentive payments. The program is offered to homes that have centrally ducted heating systems in unconditioned areas.

Touchstone Energy Home

Program Description

The program is designed to encourage new homes to be built to higher standards for thermal integrity and equipment efficiency, as well as to choose a geothermal or an air source heat pump rather than less efficient forms of heating and cooling. The program is modeled after the ENERGY STAR V2.0 for New Homes program. Homes built to Touchstone Energy Home Standards typically use 30% less energy than the same home built to typical construction standards. Plans are submitted before the home is built, a pre drywall inspection is made, and a blower door test is administered after the home is built to verify that the home meets the standard.

Target Markets

This program is designed to serve the residential new construction market. The incentives are available to any residential retail member of participating EKPC cooperatives. The primary market consists of retail members who are constructing new stick-built homes.

Touchstone Energy Manufactured Home

Program Description

The Touchstone Energy Manufactured Home is an all-electric manufactured home that is built to Energy Star® specifications. A manufactured home that is built to these standards typically uses 30% less energy. The Touchstone Energy Home includes a sealed duct system, energy efficient double-pane windows, added insulation in the roof and wall, and an improved gasket that seals the halves of the home together. Buyers of qualified manufactured homes receive a rebate from their local cooperative.

Target Markets

This program is designed to serve the new manufactured home market. The incentives are available to any residential retail member of participating EKPC cooperatives.

Commercial & Industrial Advanced Lighting including LED Program

Program Description

This program offers incentives to commercial and industrial customers to install high efficiency lamps and ballasts in their facilities. LED exit signs, T-5 fluorescent fixtures, and advanced controls are examples of eligible technologies.

Target Market

The incentive is available to any existing commercial or industrial facility in the service territory of a participating EKPC cooperative. The facility and its lighting system must have been in service for at least two years.

Industrial Compressed Air Program

Program Description

Compressed air is an essential element in a wide variety of operations found in manufacturing. Compressed air production and distribution represents one of the primary electricity costs in many industrial plants.

Both the supply side (compressors and conditioning equipment) and the demand side (distribution and end use) can be targeted to significantly improve energy efficiency.

This program is designed to reduce electricity consumption through a comprehensive approach to efficient production and delivery of compressed air in industrial facilities. The program includes (1) training of plant staff; (2) a detailed system assessment of the plant's compressed air system including written findings and recommendations, and (3) incentives for capital-intensive improvements.

EKPC shall conduct an ultrasonic compressed air leakage audit and provide the results of this audit to the customer. The report will have an estimate of the amount of excess load in kW that the leaks are causing. The report will include a list of leaks detected. Upon completion of repairs to the system, EKPC will conduct a follow-up audit and measure the difference in the kW leakage load. Rebates will be paid based on the difference in the kW leakage load.

Target Market

The program is designed to serve any existing commercial or industrial facility that uses electricity compressed air applications.

Gallatin Steel Interruptible

The objective of this program is to reduce peak through implementing a special interruptible contract with EKPC's largest retail customer, Gallatin Steel.

The Gallatin Steel Plant is a thin-slab steel mill whose electric load consists primarily of electric arc melting furnaces. EKPC and its member cooperative Owen Electric Cooperative (the EKPC member cooperative that serves Gallatin) have entered into a long term agreement with Gallatin Steel that provides certain demand credits to Gallatin in return for the right to interrupt load at Gallatin on a ten minute or ninety minute notice.

Target Market

This is a special contract that applies solely to a single customer, Gallatin Steel.

Interruptible Program

Program Description

This program offers incentives to large commercial and industrial customers in return for allowing the utility to interrupt their load. The customer signs a contract for a special interruptible rate. Customers are notified that a power interruption is to begin at a specified time. The customer then reduces their load to a pre-determined firm level. In return for allowing the utility to interrupt this load, the customers are given a monthly credit on their demand charge for all demand above the firm capacity requirements. The credit amount varies, depending on the length of the notice required and the maximum number of hours per year that the load can be interrupted.

Target Market

This program is available to existing large commercial or industrial facilities in the service territory of a participating EKPC cooperative. It is most suitable for customers who can reschedule operations quickly or who own emergency generators.

In order to qualify, a customer must have at least 250 kW of load that is interruptible, have the ability to interrupt that load with notice ranging from 10 minutes to one hour, and be willing to interrupt that load for up to 12 hours per interruption in the summer (6 hours in the winter), with a maximum of 200-400 hours of interruption per year.

2012 IRP version

Button-Up Weatherization Program

The Button Up program provides installation of unsulation materials and other weatherization techniques to reduce heat loss in the home.

Source

Assumption

<p>Load Impacts Before Participant 10,500 kWh, 8.12 kW (coinc. with winter system peak), 2.47 kW (summer)</p> <p>After Participant 8,295 kWh, 6.41 kW (winter peak), 1.95 (summer peak)</p>	<p>Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing single family homes. 70% heat pump, 30% furnace/CAC.</p> <p>same mix with 21% savings applied. 21% savings derived from site specific engineering estimates and impact evaluation results for similar programs at other utilities.</p>
<p>Lifetime of savings</p>	<p>15 Years</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 1,615</p>	<p>Costs provided by Roy Honican, December 2011.</p>
<p>Administrative Cost EK \$4,300 per year (2012-2026), 3% escalation Co-op \$263 per new participant</p>	<p>All cost estimates provided by EKPC Marketing/Communications, October 2010.</p> <p>Cost estimated from survey of coops in November 2007. Correlates well with Sept 2011 update (4.3 hours times \$58 per hour)</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 1,100 new in 2012, then 1,470 per year 2013-2026. 10% free riders</p>	<p>Based on Marketing Goal for 2012; then 50% more per year after that. Free riders based on Frontier Assoc study for LG&E/KU</p>
<p>Rebates Co-op to Participant \$500</p>	<p>In order to cover 30% of participant costs., \$40 per 1,000 BTU heat loss times typical savings of 12,500 BTU heat loss.</p>

2012 IRP version

Button-Up Weatherization Program with Air Sealing

The Button Up program, plus air sealing, provides installation of insulation materials and other weatherization techniques to reduce heat loss in the home, plus thermal bypasses from unheated to heated areas are sealed to lower infiltration losses. An additional incentive is given based on documented savings from pre and post blower door tests.

Source

Assumption

<p>Load Impacts Before Participant 10,500 kWh, 8.12 kW (coinc. with winter system peak), 2.47 kW (summer)</p> <p>After Participant 7,455 kWh, 5.77 kW (winter peak), 1.75 (summer peak)</p>	<p>Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing single family homes. 70% heat pump, 30% furnace/CAC.</p> <p>same mix with 29% savings applied. 29% savings derived from site specific field data and engineering estimates. combined with impact evaluation results for similar programs at other utilities.</p>
<p>Lifetime of savings</p>	<p>15 Years</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 2,215</p>	<p>Costs provided by Roy Honican, December 2011.</p>
<p>Administrative Cost EK \$4,500 per year (2012-2026), 3% escalation</p> <p>Co-op \$463 per new participant</p>	<p>All cost estimates provided by EKPC Marketing/Communications, October 2010.</p> <p>Cost estimated from survey of coops in November 2007. Plus \$200 for pre and post blower door test. Correlates well with Sept 2011 update (4.3 hours times \$58 per hour)</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 80 new in 2012, then 107 per year 2013-2026. 10% free riders</p>	<p>Marketing Goal for 2012; then 50% more per year after that. Free riders based on Frontier Assoc study for LG&E/KU</p>
<p>Rebates Co-op to Participant \$700</p>	<p>In order to cover 30% of participant costs., \$40 per 1,000 BTU heat loss times typical savings of 17,500 BTU heat loss.</p>

2012 IRP version

Heat Pump Retrofit

This program encourages residential members to convert their primary heat source from electric resistance heat to an air source heat pump where the existing heating system is 10 years old or older

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 14,843 kWh, 8.12 kW (coinc. with winter system peak), 2.25 kW (summer)</p> <p>After Participant 7,310 kWh, 8.12 kW (coinc. with winter system peak), 1.93 kW (summer)</p>	<p>Electric Furnace and Central A.C.</p> <p>ENERGY STAR efficiency new heat pump: SEER 14, HSPF 8.0</p>
Lifetime of savings	20 Years
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 4,150 to \$5,150 - use \$4,600 for the cost benefit	Difference in installed cost between SEER 14 heat pump and electric furnace. Spread accounts for fact that the cost of a future purchase of a furnace would be discounted.
Administrative Cost EK \$2,877 fixed annual (2011)	Estimated costs per Marketing Department, October 2010.
Co-op \$177 per new participant	Cost information provided by various coops in September 2011 survey of hours and rates.
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 400 in 2012; 533 per year, 2013-2021	Targets 30% of the existing single family market (including manufactured homes) with electric furnaces (10 years or older) and central AC in 10 years.
Rebates Co-op to Participant \$ 750	3 tier rebate: SEER 13 is \$500, SEER 14 is \$750, SEER 15 is \$1,000. Modeling SEER 14.

<u>2012 IRP version</u>		<u>ETS Furnace Program = "ETSFURNC"</u>	
<u>Assumption</u>		<u>Source</u>	
Load Impacts Before Participant 12,675 kWh, 9.62 kW (coincident with winter system peak), 0 therms		Typical electric furnace (metered study) adjusted for avg square footage of participants (1708 square feet)	
After Participant 12,775 kWh, 2.83 kW (coincident with winter system peak), 0 therms		ETS unit, 1708 square foot home. Electric furnace with ETS in the home, 1708 square foot home. Both loads come from the EKPC end use metering study (1996-1998). Modified so only dispatched on system peak days in Jan and Feb. Losses are much lower.	
Lifetime of savings		20 Years	
Generation Capacity Cost - Hybrid		PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)	
Participant Costs \$ 380		Participant pays 25% of equipment costs. EK pays 75%. Typical system size 9 kW. Includes \$830 installation cost, \$1,433 for the unit, \$40 for the meter base, and \$230 for the meter/load control device. Provided by Ruby Patterson, SKRECC, 9/2011.	
Administrative Cost EK \$16,500 fixed annual (2012-2026), \$2,226 per new participant		All cost estimates provided by EKPC Marketing/Communications, June 2005, adjusted 10% to 2009 \$. EK pays 85% of installed equipment costs (\$ 2153). Variable admin is \$73 per new partic.	
Co-op \$368 per new participant		Based on labor rate and hours reported by SKRECC for ETS, 9/2011.	
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966		Current rates in effect as of June, 2011. same rate after installation of ETS (no retail rate discount)	
Rate Schedule - Wholesale East Kentucky E-2 rate.		Current rates in effect as of June, 2011.	
Participation - 70 new in 2012, 105 new (2013-2026), 0% free riders		Marketing Goal for 2011 used for 2012, 50% increase thereafter.	
Rebates Co-op to Participant \$ 90 per year		\$20 per kW times 4.5 kW peak savings - to balance RIMs and participant test results	

2012 IRP version Direct Load Control of Residential Air Conditioners and Water Heaters

Reduce peak demand and energy usage through the installation of load control devices on air conditioners and electric water heaters.

Assumption

Load Impacts

Water Heater Savings
10 kWh, 0.52 kW (coincident with winter system peak), 0.37 kW (summer)

Based on M&V data for the program

Air Conditioner savings

5 kWh, 0.00 kW (coincident with winter system peak), 1.0 kW (summer)

Based on M&V data for the program

Lifetime of savings

20 Years

Generation Capacity Cost - Hybrid

PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)

Participant Costs \$ 0

Administrative Cost

EK \$ 2.6 million total admin cost in 2012, escalates at 3% per year through 2017, then drops to \$2.1 million in 2018, \$830k in 2019, escalates at 3% per year after that.

Calculated using participation for this case. Includes device costs, installation, transportation, scheduling, enrollment, recruitment, and servicing; also marketing, communications, IT, customer service, management contract fee, general admin, M&V.

Co-op \$0 per new participant

Rate Schedule - Retail

Average Residential Rate for Co-ops
Cust chrg \$9.62, Energy Rate \$.08966

Current rates in effect as of June, 2011.

Rate Schedule - Wholesale

East Kentucky E-2 rate.

Current rates in effect as of June, 2011.

Participation - 6500 new AC and 3510 new WH per year (2012-2017); 3457 new AC and 1867 new WH in 2018.

Given expected counts as of Dec 31, 2011, and expected annual rate of 6,500 AC and 3,510 WH installed, hitting 50,000 cumulative AC installed in 2018.

Rebates

Co-op to Participant \$20 AC, \$10 WH

Program as filed

2012 IRP version

Residential Efficient Lighting Program: "EFFLTG_R"

To transform the residential lighting market by facilitating a shift in consumer purchasing decisions from market baseline efficiency to higher efficiency lighting products. Partnership with retailer.

Source

Assumption

<p>Load Impacts Before Participant 392 kWh, 0.065 kW (coincident with winter system peak), 0.039 kW summer</p> <p>After Participant 120 kWh, 0.020 kW (coincident with winter system peak), 0.012 kW summer</p>	<p>10 EISA compliant Halogen light bulbs, 43 watts each</p> <p>Portfolio of 10 CFL and LED light bulbs providing equivalent lumens. Savings are modeled year by year for years 2012-2016 to capture transition to EISA efficiency standard in the market (baseline) and with the program. Savings are higher in earlier years because baseline wattage is higher.</p>
<p>Lifetime of savings</p>	<p>8 Years, 9,000 hour rated life, 20% attrition (removals)</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 52.50</p>	<p>Price premium to purchase the package of CFLs and LEDs versus Halogen light bulbs. Incremental costs are modeled year by year for period 2012-2016.</p>
<p>Administrative Cost</p> <p>EK \$ 35,000 fixed annual (2012-2021)</p> <p>Co-op \$0 per new participant</p>	<p>Assumes \$10,000 per year for admin and evaluation, and \$25,000 per year for promotional activities (mailings, trade ally). Cost estimates provided by Jeff Hohnman, Dec 2011.</p> <p>EKPC pays for all program costs</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 50,000 per year, 10 years (2012-2021). Unit is ten(10) light bulbs for ease of modeling. 20% free riders (in 2016).</p>	<p>Goal of 1.3 new high efficiency light bulbs per residence per year. Free rider estimate is from review of several studies. Free rider is defined as a program participant who would have installed the measure anyway even without the program. Free riders modeled year by year for 2012-2016. Program assumes a transition period in 2020 and 2021 for meeting CFL equivalent Federal standard in 2020.</p>
<p>Rebates Co-op to Participant \$0</p>	<p>Rebate paid by EKPC</p>

2012 IRP version

Enhanced Touchstone Energy New Construction Heat Pump Home = "TE_NC_EN"

Encourages new homes to be built to higher standards for thermal integrity and equipment efficiency and high efficient heat pump systems. Measures include air sealing and insulation equivalent to 2009 IECC standards, with specific focus on completed the Thermal Bypass Checklist.

<u>Assumption</u>	<u>Source</u>
<p>Load Impacts Before Participant 10,574 kWh, 8.69 kW (coincident with winter system peak), 2.35 kW (summer)</p>	<p>Typical practice heat pump: SEER 13, HSPF 7.7, 1700 square foot home, built to 2006 IECC standards. Standard electric hot water heater (2007 update to kWh).</p>
<p>After Participant 8,006 kWh, 6.21 kW (coincident with winter system peak), 1.69 kW (summer)</p>	<p>Typical practice air source heat pump: SEER 14.5, HSPF 8.2, 1700 square foot home, built to Touchstone Energy Home standards, with continuous insulation, R-38 in attic, air barrier, sealed duct work, and completed thermal bypass checklist. Efficient electric hot water heater (2007 update).</p>
Lifetime of savings	20 Years
Generation Capacity Cost - Hybrid	PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$1,800	Includes (1) costs associated with bringing standard built Kentucky home to enhanced Touchstone Energy standards (2009 IECC); (2) savings from equipment resizing (1/2 ton reduction); (3) incremental cost of an efficient water heater. KY tax credit no longer applied because of inability for builders to claim given legal structure (per Josh, Sept 2011). Cost estimates from E.On. DSM filing, marketing dept sources, and Blue Grass data.
Administrative Cost EK \$15,437 fixed annual (2012-2026)	Based on 2010 actual.
Co-op \$ 400 per new participant	Costs of rating and inspection. Based on Sep 2011 survey of members for hours and labor rates
Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 500 new in 2012, growing to 750 new in 2017, 800 in 2026. 5% Free Riders	targets 20% of the eligible market - new single family homes with electric heat - each year. Free riders based on Frontier Assoc study for LG&E/KU
Rebates Co-op to Participant \$ 750	Higher value needed to motivate builders to implement measures. Customer also receives free Energy Star rating (\$500 value)

2012 IRP version

Touchstone Energy Manufactured Home = "MHA0302A"

All Electric manufactured home built to Touchstone Energy specifications.

Source

Assumption

<p>Load Impacts Before Participant 17,194 kWh, 9.58 kW (coincident with winter system peak), 3.06 kW (summer)</p> <p>After Participant 12,036 kWh, 6.70 kW (coincident with winter system peak), 2.14 kW (summer)</p>	<p>Heating & cooling electricity loads for a standard efficiency manufactured home</p> <p>30% savings achieved by Manufactured Home conforming to Touchstone Energy standards (Marketing 2002)</p>
<p>Lifetime of savings</p>	<p>20 Years</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 2,500</p>	<p>Based on feedback from Josh in marketing, and review of Northwest Power Plan program data.</p>
<p>Administrative Cost EK \$ 2,169 fixed annual (2012-2026), \$100 per new participant</p> <p>Co-op \$216 per new participant</p>	<p>All cost estimates provided by EKPC Marketing/Communications, October 2010. \$100 represents incentive payment to dealer</p> <p>Cost information provided by various coops and verified by Marketing 5/2011.</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p> <p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p> <p>Current rates in effect as of June, 2011.</p>
<p>Participation - 34 new in 2012, growing to 45 new in 2017 thru 2026. 5% Free Riders</p> <p>Rebates Co-op to Participant \$1,000</p>	<p>targets 20% of the eligible market - new manufactured homes with electric heat - each year. Free riders based on Frontier Assoc study for LG&E/KU</p> <p>Higher level to increase participation. Based on North Carolina program.</p>

2012 IRP version

Tune-Up HVAC Program with Duct Sealing

Coil cleaning and other maintenance measures combined with sealing of ductwork. Reductions in duct losses are measured using a blower door test.

Source

Assumption

<p>Load Impacts Before Participant 8,650 kWh, 8.12 kW (coincident with winter system peak), 2.47 kW (summer)</p>	<p>HVAC loads for a typical heat pump in typical residence: mix of SEER 10 and SEER 12</p>
<p>After Participant 7,612 kWh, 7.15 kW (coincident with winter system peak), 2.17 kW (summer)</p>	<p>HVAC loads for a typical heat pump home reduced by 12% savings. 12 % savings derived from ACEEE report and site specific blower door results.</p>
<p>Lifetime of savings</p>	<p>12 Years</p>
<p>Generation Capacity Cost - Hybrid</p>	<p>PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)</p>
<p>Participant Costs \$ 300.00</p>	<p>Average payment to contractors for performing the measures in the program. Source: EKPC Marketing Department - based on Jackson program</p>
<p>Administrative Cost EK \$5,400 per year fixed (2012-2026)</p>	<p>All cost estimates provided by EKPC Marketing/Communications, October 2010.</p>
<p>Co-op \$ 378 per customer</p>	<p>Based on survey of coop members for labor hours and rates, Sep 2011</p>
<p>Rate Schedule - Retail Average Residential Rate for Co-ops Cust chrg \$9.62, Energy Rate \$.08966</p>	<p>Current rates in effect as of June, 2011.</p>
<p>Rate Schedule - Wholesale East Kentucky E-2 rate.</p>	<p>Current rates in effect as of June, 2011.</p>
<p>Participation - 500 new in 2012, 670 new per year for 2013-2026. 20% free riders</p>	<p>Marketing Goal used for 2012. 50% increase thereafter. Free riders % based on Frontier Assoc study for LG&E/KU and CPUC DEER update.</p>
<p>Rebates Co-op to Participant \$260</p>	<p>Average payment to contractors is \$300; participating member pays \$40.</p>

<u>2012 IRP version</u>	
Commercial Lighting including advanced measures/LED exit signs	
This Commercial & Industrial Advanced Lighting program offers incentives to commercial and industrial customers to install high efficiency lamps and ballasts in their facilities.	
<u>Source</u>	
Load Impacts Before Participant 14, 185 kWh, 1.51 kW (coincident with winter system peak), 2.83 kW (summer)	Lighting load for typical 2,365 square foot commercial building. Equates to 1 kW connected load savings which is unit for program. EUI of 6 kWh per square foot (sources: EPRI Market Profiles, Duke Power end use metering study).
Assumption After Participant 9,933 kWh, 1.06 kW (coincident with winter system peak), 1.98 kW (summer)	Lighting load for 2,365 square foot building with 30% savings applied. Based on achievable potential reported by several sources: EPA, utility impact evaluations. With T5, controls, LED exit signs
Lifetime of savings	10 Years (source: DEEM database)
Generation Capacity Cost - Hybrid	P-JM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)
Participant Costs \$ 980 per unit (through 2015; then \$1318)	Midrange of reported values from several programs in NY, CA, MA, Northeast, and national. Used \$0.31 per annual saved kWh (NEEP 2004, adjusted to \$2009, premium for advanced). KY Tax credit of \$500 applied through 2015 (based on typical facility of 3,500 square feet).
Administrative Cost EK \$ 50,000 fixed annual, \$0 per new participant	Based on program tracking. Consistent with survey of utility programs - includes setup, marketing, contractor relations, monitoring & eval, customer field work.
Co-op \$ 0 per new participant	EKPC manages rebates, QC and marketing
Rate Schedule - Retail South Kentucky B rate	Current rates in effect as of June, 2011.
Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of June, 2011.
Participation - 1,250 new units per year (2012-2026), 20% free ridership	Based on achieving 20% coverage of commercial floorspace in 15 years. 1 unit = 1 kW connected load savings= 2,365 square feet of treated space (for comparison, the 2013 marketing goal is 860 units) Free rider based on updated study done by CA PUC DEER. Free rider is a participant who would have installed the measure anyway in the absence of the program.
Rebates Co-op to Participant \$213 per kW saved	Marketing rebate for 2012.

2012 IRP version

Industrial Compressed Air Program

Reduces electricity consumption through a comprehensive approach to efficient production and delivery of compressed air in industrial facilities. The program includes, assessment, training, and financial incentives for capital intensive improvements.

Source

Assumption

Load Impacts

Before Participant
25,320 kWh, 2.00 kW (coincident with
winter system peak), 4.99 (summer)

Compressed air load for industrial corresponding to 1 kW of connected load savings

After Participant

21,520 kWh, 1.70 kW (coincident with
winter system peak), 4.24 (summer)

Compressed air load after program. 15% savings. Source: US DOE Industrial Technologies Program.

Lifetime of savings 7 years

Source: BPA and Pacific Northwest planning numbers. Mix of O&M and capital measures

Generation Capacity Cost - Hybrid

PJM Market (2012); Peaker (2013-2016); Combined Cycle Baseload (2017 on)

Participant Costs \$ 760 per unit (1 kw
savings)

Typical cost of \$0.20 per annual kWh savings from set of case studies provided by US DOE

Administrative Cost

EK \$30,000 fixed annual, \$0 per new
participant

Marketing, Trade Allies, Tracking, Processing, Eval, Cust Svc. Includes efforts to promote formal training and distribution of Compressed Air Challenge manual. Program experience to date validates the cost.

Co-op \$75 per new 1 kW savings

Audit/assessment costs.

Rate Schedule - Retail

Owen Schedule II

Current rates in effect as of June, 2011.

Rate Schedule - Wholesale

East Kentucky E-2 rate.

Cust chrg \$21.31, Demand charge \$6.13 per kW, Energy Rate \$.06498 per kWh

Current rates in effect as of June, 2011.

Participation - 1,560 new units per year for
2012, then 2080 units (2013-2026) 10%
Free riders.

Marketing Goal for 2011. 33% higher thereafter. Units are 1 kW of connected load saved.

Rebates

Co-op to Participant \$ 0

Audit reimbursement treated as admin cost above.

Button Up for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 27,609,676	Revenue Declines	(\$36,645,561)
Rebates From EK	\$17,954,043	Administrative Costs	(\$4,540,301)
		Rebates Paid To Consumers	(\$8,631,751)
Total Benefits	\$45,563,719	Total Costs	(\$49,817,613)
Benefit / Cost Ratio: 0.91			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$17,844,490	Up Front Investment	(\$17,591,890)
Rebates From Distribution System	\$ 6,051,562		
Reductions in O&M costs	\$0		
Total Benefits	\$23,896,052	Total Costs	(\$17,591,890)
Benefit / Cost Ratio: 1.36			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$18,828,631	Up Front Customer Investment	(\$25,092,501)
Avoided Gen Capacity Costs	\$23,102,618	Distribution System Admin. Costs	(\$4,540,301)
Avoided Transmission Expense	\$3,946,290	EK Administrative Costs	(\$51,581)
Reduced Customer O&M costs	\$0		
Total Benefits	\$45,877,538	Total Costs	(\$29,684,384)
Benefit / Cost Ratio: 1.55			

EK Benefits		EK Costs	
Avoided Energy Costs	\$18,828,631	Decrease In Revenue	(\$27,609,676)
Avoided Gen Capacity Costs	\$23,102,618	Rebates Paid	(\$17,954,043)
Avoided Transmission Expense	\$3,946,290	Administrative Costs	(\$51,581)
Total Benefits	\$45,877,538	Total Costs	(\$45,615,300)
Benefit / Cost Ratio: 1.01			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$22,652,659	Up Front Customer Investment	(\$27,571,969)
Avoided Gen Capacity Costs	\$28,469,128	Distribution System Admin. Costs	(\$4,988,942)
Avoided Transmission Expense	\$4,738,981	EK Administrative Costs	(\$56,571)
Environmental Externalities	\$0		
Total Benefits	\$55,860,768	Total Costs	(\$32,617,483)
Benefit / Cost Ratio: 1.71			

Combined RIM:
Benefits: \$45,877,538 Costs: (\$49,869,194)

Benefit / Cost Ratio: 0.92

Button Up with Air Sealing for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 2,775,115	Revenue Declines	(\$3,683,351)
Rebates From EK	\$1,941,334	Administrative Costs	(\$581,772)
		Rebates Paid To Consumers	(\$879,569)
Total Benefits	\$4,716,449	Total Costs	(\$5,144,692)
Benefit / Cost Ratio: 0.92			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$1,793,556	Up Front Investment	(\$1,756,089)
Rebates From Distribution System	\$ 616,635		
Reductions in O&M costs	\$0		
Total Benefits	\$2,410,191	Total Costs	(\$1,756,089)
Benefit / Cost Ratio: 1.37			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$1,892,522	Up Front Customer Investment	(\$2,504,887)
Avoided Gen Capacity Costs	\$2,322,127	Distribution System Admin. Costs	(\$581,772)
Avoided Transmission Expense	\$396,652	EK Administrative Costs	(\$53,980)
Reduced Customer O&M costs	\$0		
Total Benefits	\$4,611,301	Total Costs	(\$3,140,639)
Benefit / Cost Ratio: 1.47			

EK Benefits		EK Costs	
Avoided Energy Costs	\$1,892,522	Decrease In Revenue	(\$2,775,115)
Avoided Gen Capacity Costs	\$2,322,127	Rebates Paid	(\$1,941,334)
Avoided Transmission Expense	\$396,652	Administrative Costs	(\$53,980)
Total Benefits	\$4,611,301	Total Costs	(\$4,770,429)
Benefit / Cost Ratio: 0.97			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$2,276,897	Up Front Customer Investment	(\$2,752,416)
Avoided Gen Capacity Costs	\$2,861,549	Distribution System Admin. Costs	(\$639,262)
Avoided Transmission Expense	\$476,330	EK Administrative Costs	(\$59,202)
Environmental Externalities	\$0		
Total Benefits	\$5,614,776	Total Costs	(\$3,450,880)
Benefit / Cost Ratio: 1.63			

Combined RIM:
Benefits: \$4,611,301 Costs: (\$5,198,672)

Benefit / Cost Ratio: 0.89

Heat Pump Retrofit for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 28,178,794	Revenue Declines	(\$44,973,610)
Rebates From EK	\$8,701,967	Administrative Costs	(\$791,901)
		Rebates Paid To Consumers	(\$3,355,514)
Total Benefits	\$36,880,761	Total Costs	(\$49,121,025)
Benefit / Cost Ratio: 0.75			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$22,155,879	Up Front Investment	(\$16,124,938)
Rebates From Distribution System	\$ 2,629,066		
Reductions in O&M costs	\$0		
Total Benefits	\$24,784,945	Total Costs	(\$16,124,938)
Benefit / Cost Ratio: 1.54			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$22,181,950	Up Front Customer Investment	(\$20,580,488)
Avoided Gen Capacity Costs	\$4,656,005	Distribution System Admin. Costs	(\$791,901)
Avoided Transmission Expense	\$780,463	EK Administrative Costs	(\$24,868)
Reduced Customer O&M costs	\$0		
Total Benefits	\$27,618,418	Total Costs	(\$21,397,257)
Benefit / Cost Ratio: 1.29			

EK Benefits		EK Costs	
Avoided Energy Costs	\$22,181,950	Decrease In Revenue	(\$28,178,794)
Avoided Gen Capacity Costs	\$4,656,005	Rebates Paid	(\$8,701,967)
Avoided Transmission Expense	\$780,463	Administrative Costs	(\$24,868)
Total Benefits	\$27,618,418	Total Costs	(\$36,905,629)
Benefit / Cost Ratio: 0.75			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$26,631,149	Up Front Customer Investment	(\$21,907,924)
Avoided Gen Capacity Costs	\$5,744,138	Distribution System Admin. Costs	(\$842,979)
Avoided Transmission Expense	\$935,301	EK Administrative Costs	(\$26,425)
Environmental Externalities	\$0		
Total Benefits	\$33,310,588	Total Costs	(\$22,777,328)
Benefit / Cost Ratio: 1.46			

Combined RIM:
Benefits: \$27,618,418 Costs: (\$49,145,893)

Benefit / Cost Ratio: 0.56

ETS Furnace for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 1,005,058	Revenue Declines	\$0
Rebates From EK	\$1,747,496	Administrative Costs	(\$450,629)
Revenue increases	\$185,131	Rebates Paid To Consumers	(\$1,747,496)
Total Benefits	\$2,937,685	Total Costs	(\$2,198,125)
Benefit / Cost Ratio: 1.34			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$0	Up Front Investment	(\$325,256)
Rebates From Distribution System	\$ 690,402	Electric Bill Increase	(\$75,608)
Reductions in O&M costs	\$0		
Total Benefits	\$690,402	Total Costs	(\$400,864)
Benefit / Cost Ratio: 1.72			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$190,109	Up Front Customer Investment	(\$465,324)
Avoided Gen Capacity Costs	\$8,062,872	Distribution System Admin. Costs	(\$450,629)
Avoided Transmission Expense	\$519,040	EK Administrative Costs	(\$3,059,390)
Reduced Customer O&M costs	\$0		
Total Benefits	\$8,772,021	Total Costs	(\$3,975,342)
Benefit / Cost Ratio: 2.21			

EK Benefits		EK Costs	
Avoided Energy Costs	\$190,109	Decrease In Revenue	(\$1,005,058)
Avoided Gen Capacity Costs	\$8,062,872	Rebates Paid	(\$1,747,496)
Avoided Transmission Expense	\$519,040	Administrative Costs	(\$3,059,390)
Total Benefits	\$8,772,021	Total Costs	(\$5,811,944)
Benefit / Cost Ratio: 1.51			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$232,210	Up Front Customer Investment	(\$511,626)
Avoided Gen Capacity Costs	\$10,701,788	Distribution System Admin. Costs	(\$495,469)
Avoided Transmission Expense	\$641,853	EK Administrative Costs	(\$3,401,619)
Environmental Externalities	\$0		
Total Benefits	\$11,575,851	Total Costs	(\$4,408,714)
Benefit / Cost Ratio: 2.63			

Combined RIM:
Benefits: \$8,772,021 Costs: (\$5,257,515)

Benefit / Cost Ratio: 1.67

**Residential DLC of AC and WH for 2012 IRP with updated system lambda (2012) for
avoided energy costs**

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 23,518,434	Revenue Declines	(\$2,114,536)
Rebates From EK	\$14,671,049	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$14,671,049)
Total Benefits	\$38,189,483	Total Costs	(\$16,785,585)
Benefit / Cost Ratio: 2.28			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$1,181,758	Up Front Investment	\$0
Rebates From Distribution System	\$ 8,025,424		
Reductions in O&M costs	\$0		
Total Benefits	\$9,207,181	Total Costs	\$0
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$1,319,323	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$52,628,100	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$9,118,923	EK Administrative Costs	(\$22,585,417)
Reduced Customer O&M costs	\$0		
Total Benefits	\$63,066,346	Total Costs	(\$22,585,417)
Benefit / Cost Ratio: 2.79			

EK Benefits		EK Costs	
Avoided Energy Costs	\$1,319,323	Decrease In Revenue	(\$23,518,434)
Avoided Gen Capacity Costs	\$52,628,100	Rebates Paid	(\$14,671,049)
Avoided Transmission Expense	\$9,118,923	Administrative Costs	(\$22,585,417)
Total Benefits	\$63,066,346	Total Costs	(\$60,774,901)
Benefit / Cost Ratio: 1.04			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$1,555,864	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$61,891,066	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$10,669,733	EK Administrative Costs	(\$24,669,224)
Environmental Externalities	\$0		
Total Benefits	\$74,116,663	Total Costs	(\$24,669,224)
Benefit / Cost Ratio: 3.00			

Combined RIM:
Benefits: \$63,066,346 Costs: (\$39,371,002)

Benefit / Cost Ratio: 1.60

**R12 Residential Efficient Lighting Program for 2012 IRP with updated system lambda
(2012) for avoided energy costs**

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 40,717,098	Revenue Declines	(\$61,207,644)
Rebates From EK	\$9,559,464	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$9,559,464)
Total Benefits	\$50,276,562	Total Costs	(\$70,767,107)
Benefit / Cost Ratio: 0.71			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$40,723,795	Up Front Investment	(\$11,184,523)
Rebates From Distribution System	\$ 7,376,289		
Reductions in O&M costs	\$0		
Total Benefits	\$48,100,084	Total Costs	(\$11,184,523)
Benefit / Cost Ratio: 4.30			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$30,648,331	Up Front Customer Investment	(\$14,640,506)
Avoided Gen Capacity Costs	\$10,455,643	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$2,001,074	EK Administrative Costs	(\$302,525)
Reduced Customer O&M costs	\$0		
Total Benefits	\$43,105,047	Total Costs	(\$14,943,031)
Benefit / Cost Ratio: 2.88			

EK Benefits		EK Costs	
Avoided Energy Costs	\$30,648,331	Decrease In Revenue	(\$40,717,098)
Avoided Gen Capacity Costs	\$10,455,643	Rebates Paid	(\$9,559,464)
Avoided Transmission Expense	\$2,001,074	Administrative Costs	(\$302,525)
Total Benefits	\$43,105,047	Total Costs	(\$50,579,086)
Benefit / Cost Ratio: 0.85			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$34,142,303	Up Front Customer Investment	(\$15,671,964)
Avoided Gen Capacity Costs	\$11,642,458	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$2,222,865	EK Administrative Costs	(\$321,474)
Environmental Externalities	\$0		
Total Benefits	\$48,007,626	Total Costs	(\$15,993,438)
Benefit / Cost Ratio: 3.00			

Combined RIM:
Benefits: \$43,105,047 Costs: (\$71,069,632)

Benefit / Cost Ratio: 0.61

Touchstone Energy Home for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 20,663,800	Revenue Declines	(\$32,820,434)
Rebates From EK	\$11,287,596	Administrative Costs	(\$3,527,374)
		Rebates Paid To Consumers	(\$6,613,826)
Total Benefits	\$31,951,397	Total Costs	(\$42,961,634)
Benefit / Cost Ratio: 0.74			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$13,284,207	Up Front Investment	(\$10,474,707)
Rebates From Distribution System	\$ 4,594,170		
Reductions in O&M costs	\$0		
Total Benefits	\$17,878,376	Total Costs	(\$10,474,707)
Benefit / Cost Ratio: 1.71			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$13,534,816	Up Front Customer Investment	(\$15,079,523)
Avoided Gen Capacity Costs	\$30,072,293	Distribution System Admin. Costs	(\$3,527,374)
Avoided Transmission Expense	\$3,724,367	EK Administrative Costs	(\$185,176)
Reduced Customer O&M costs	\$0		
Total Benefits	\$47,331,476	Total Costs	(\$18,792,073)
Benefit / Cost Ratio: 2.52			

EK Benefits		EK Costs	
Avoided Energy Costs	\$13,534,816	Decrease In Revenue	(\$20,663,800)
Avoided Gen Capacity Costs	\$30,072,293	Rebates Paid	(\$11,287,596)
Avoided Transmission Expense	\$3,724,367	Administrative Costs	(\$185,176)
Total Benefits	\$47,331,476	Total Costs	(\$32,136,573)
Benefit / Cost Ratio: 1.47			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$16,548,904	Up Front Customer Investment	(\$16,606,830)
Avoided Gen Capacity Costs	\$40,013,746	Distribution System Admin. Costs	(\$3,884,638)
Avoided Transmission Expense	\$4,612,990	EK Administrative Costs	(\$203,090)
Environmental Externalities	\$0		
Total Benefits	\$61,175,640	Total Costs	(\$20,694,558)
Benefit / Cost Ratio: 2.96			

Combined RIM:
Benefits: \$47,331,476 Costs: (\$43,146,810)

Benefit / Cost Ratio: 1.10

Touchstone Energy Manufactured Home for 2012 IRP with updated system lambda
(2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 2,235,827	Revenue Declines	(\$3,913,670)
Rebates From EK	\$772,369	Administrative Costs	(\$113,106)
		Rebates Paid To Consumers	(\$523,640)
Total Benefits	\$3,008,195	Total Costs	(\$4,550,416)
Benefit / Cost Ratio: 0.66			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$1,584,556	Up Front Investment	(\$864,041)
Rebates From Distribution System	\$ 363,807		
Reductions in O&M costs	\$0		
Total Benefits	\$1,948,363	Total Costs	(\$864,041)
Benefit / Cost Ratio: 2.25			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$1,609,495	Up Front Customer Investment	(\$1,243,645)
Avoided Gen Capacity Costs	\$2,258,578	Distribution System Admin. Costs	(\$113,106)
Avoided Transmission Expense	\$278,116	EK Administrative Costs	(\$78,382)
Reduced Customer O&M costs	\$0		
Total Benefits	\$4,146,189	Total Costs	(\$1,435,133)
Benefit / Cost Ratio: 2.89			

EK Benefits		EK Costs	
Avoided Energy Costs	\$1,609,495	Decrease In Revenue	(\$2,235,827)
Avoided Gen Capacity Costs	\$2,258,578	Rebates Paid	(\$772,369)
Avoided Transmission Expense	\$278,116	Administrative Costs	(\$78,382)
Total Benefits	\$4,146,189	Total Costs	(\$3,086,578)
Benefit / Cost Ratio: 1.34			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$1,967,866	Up Front Customer Investment	(\$1,369,537)
Avoided Gen Capacity Costs	\$3,004,954	Distribution System Admin. Costs	(\$124,556)
Avoided Transmission Expense	\$344,457	EK Administrative Costs	(\$86,200)
Environmental Externalities	\$0		
Total Benefits	\$5,317,277	Total Costs	(\$1,580,293)
Benefit / Cost Ratio: 3.36			

Combined RIM:
Benefits: \$4,146,189 Costs: (\$4,628,798)

Benefit / Cost Ratio: 0.90

TuneUp for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 4,696,529	Revenue Declines	(\$5,607,794)
Rebates From EK	\$3,933,519	Administrative Costs	(\$2,973,741)
		Rebates Paid To Consumers	(\$2,045,430)
Total Benefits	\$8,630,049	Total Costs	(\$10,626,964)
Benefit / Cost Ratio: 0.81			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$2,991,567	Up Front Investment	(\$1,323,607)
Rebates From Distribution System	\$ 1,433,908		
Reductions in O&M costs	\$0		
Total Benefits	\$4,425,475	Total Costs	(\$1,323,607)
Benefit / Cost Ratio: 3.34			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$3,059,948	Up Front Customer Investment	(\$1,888,089)
Avoided Gen Capacity Costs	\$3,716,663	Distribution System Admin. Costs	(\$2,973,741)
Avoided Transmission Expense	\$708,700	EK Administrative Costs	(\$64,776)
Reduced Customer O&M costs	\$0		
Total Benefits	\$7,485,312	Total Costs	(\$4,926,606)
Benefit / Cost Ratio: 1.52			

EK Benefits		EK Costs	
Avoided Energy Costs	\$3,059,948	Decrease In Revenue	(\$4,696,529)
Avoided Gen Capacity Costs	\$3,716,663	Rebates Paid	(\$3,933,519)
Avoided Transmission Expense	\$708,700	Administrative Costs	(\$64,776)
Total Benefits	\$7,485,312	Total Costs	(\$8,694,825)
Benefit / Cost Ratio: 0.86			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$3,631,110	Up Front Customer Investment	(\$2,074,690)
Avoided Gen Capacity Costs	\$4,405,292	Distribution System Admin. Costs	(\$3,267,636)
Avoided Transmission Expense	\$835,783	EK Administrative Costs	(\$71,043)
Environmental Externalities	\$0		
Total Benefits	\$8,872,184	Total Costs	(\$5,413,368)
Benefit / Cost Ratio: 1.64			

Combined RIM:
Benefits: \$7,485,312 Costs: (\$10,691,740)

Benefit / Cost Ratio: 0.70

C20 Commercial Advanced Lighting for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 25,170,735	Revenue Declines	(\$40,708,582)
Rebates From EK	\$ 7,992,055	Administrative Costs	\$0
		Rebates Paid To Consumers	(\$3,193,823)
Total Benefits	\$33,162,790	Total Costs	(\$43,902,405)
Benefit / Cost Ratio: 0.76			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$23,014,545	Up Front Investment	(\$10,000,501)
Rebates From Distribution System	\$ 2,259,163		
Reductions in O&M costs	\$0		
Total Benefits	\$25,273,708	Total Costs	(\$10,000,501)
Benefit / Cost Ratio: 2.53			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$18,709,243	Up Front Customer Investment	(\$14,523,374)
Avoided Gen Capacity Costs	\$8,062,794	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$1,480,339	EK Administrative Costs	(\$599,779)
Reduced Customer O&M costs	\$0		
Total Benefits	\$28,252,376	Total Costs	(\$15,123,153)
Benefit / Cost Ratio: 1.87			

EK Benefits		EK Costs	
Avoided Energy Costs	\$18,709,243	Decrease In Revenue	(\$25,170,735)
Avoided Gen Capacity Costs	\$8,062,794	Rebates Paid	(\$7,992,055)
Avoided Transmission Expense	\$1,480,339	Administrative Costs	(\$599,779)
Total Benefits	\$28,252,376	Total Costs	(\$33,762,569)
Benefit / Cost Ratio: 0.84			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$21,884,590	Up Front Customer Investment	(\$16,025,787)
Avoided Gen Capacity Costs	\$9,393,278	Distribution System Admin. Costs	\$0
Avoided Transmission Expense	\$1,720,794	EK Administrative Costs	(\$657,801)
Environmental Externalities	\$0		
Total Benefits	\$32,998,662	Total Costs	(\$16,683,588)
Benefit / Cost Ratio: 1.98			

Combined RIM:
Benefits: \$28,252,376 Costs: (\$44,502,184)

Benefit / Cost Ratio: 0.63

I4 Compressed Air for 2012 IRP with updated system lambda (2012) for avoided energy costs

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 29,288,422	Revenue Declines	(\$38,303,442)
Rebates From EK	\$5,496,932	Administrative Costs	(\$1,832,311)
		Rebates Paid To Consumers	\$0
Total Benefits	\$34,785,354	Total Costs	(\$40,135,753)
Benefit / Cost Ratio: 0.87			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$23,061,440	Up Front Investment	(\$11,716,267)
Rebates From Distribution System	\$ -		
Reductions in O&M costs	\$0		
Total Benefits	\$23,061,440	Total Costs	(\$11,716,267)
Benefit / Cost Ratio: 1.97			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$20,461,000	Customer Investment	(\$16,710,672)
Avoided Gen Capacity Costs	\$8,875,770	Distribution System Admin. Costs	(\$1,832,311)
Avoided Transmission Expense	\$1,586,552	EK Administrative Costs	(\$359,867)
Reduced Customer O&M costs	\$0		
Total Benefits	\$30,923,322	Total Costs	(\$18,902,850)
Benefit / Cost Ratio: 1.64			

EK Benefits		EK Costs	
Avoided Energy Costs	\$20,461,000	Decrease In Revenue	(\$29,288,422)
Avoided Gen Capacity Costs	\$8,875,770	Rebates Paid	(\$5,496,932)
Avoided Transmission Expense	\$1,586,552	Administrative Costs	(\$359,867)
Total Benefits	\$30,923,322	Total Costs	(\$35,145,221)
Benefit / Cost Ratio: 0.88			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$23,493,823	Up Front Customer Investment	(\$18,361,666)
Avoided Gen Capacity Costs	\$10,162,735	Distribution System Admin. Costs	(\$2,013,341)
Avoided Transmission Expense	\$1,812,517	EK Administrative Costs	(\$394,681)
Environmental Externalities	\$0		
Total Benefits	\$35,469,074	Total Costs	(\$20,769,687)
Benefit / Cost Ratio: 1.71			

Combined RIM:
Benefits: \$30,923,322 Costs: (\$40,495,620)

Benefit / Cost Ratio: 0.76

Exhibit DSM-7

Load Impacts by Program

Load Impacts of DSM Programs

Existing: Please note that these tables, except for Gallatin Steel Interruptible and Interruptible Program, do not include the effect of current participants in existing programs.

Button-Up Weatherization Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,100	-2,358	-1.6	-0.5
2013	2,570	-5,508	-3.7	-1.3
2014	4,040	-8,659	-5.9	-2.0
2015	5,510	-11,809	-8.0	-2.7
2016	6,980	-14,960	-10.2	-3.4
2017	8,450	-18,111	-12.3	-4.1
2018	9,920	-21,261	-14.5	-4.8
2019	11,390	-24,412	-16.6	-5.5
2020	12,860	-27,562	-18.7	-6.3
2021	14,330	-30,713	-20.9	-7.0
2022	15,800	-33,864	-23.0	-7.7
2023	17,270	-37,014	-25.2	-8.4
2024	18,740	-40,165	-27.3	-9.1
2025	20,210	-43,315	-29.5	-9.8
2026	21,680	-46,466	-31.6	-10.6

Button-Up with Air Sealing Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	80	-237	-0.2	-0.1
2013	187	-553	-0.4	-0.1
2014	294	-870	-0.6	-0.2
2015	401	-1,187	-0.8	-0.3
2016	508	-1,504	-1.0	-0.3
2017	615	-1,820	-1.2	-0.4
2018	722	-2,137	-1.5	-0.5
2019	829	-2,454	-1.7	-0.6
2020	936	-2,770	-1.9	-0.6
2021	1,043	-3,087	-2.1	-0.7
2022	1,150	-3,404	-2.3	-0.8
2023	1,257	-3,720	-2.5	-0.8
2024	1,364	-4,037	-2.7	-0.9
2025	1,471	-4,354	-3.0	-1.0
2026	1,578	-4,670	-3.2	-1.1

Residential Heat Pump Retrofit

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	400	-3,254	-0.3	-0.1
2013	933	-7,590	-0.8	-0.3
2014	1,466	-11,925	-1.3	-0.5
2015	1,999	-16,261	-1.7	-0.7
2016	2,532	-20,597	-2.2	-0.8
2017	3,065	-24,932	-2.7	-1.0
2018	3,598	-29,268	-3.1	-1.2
2019	4,131	-33,604	-3.6	-1.4
2020	4,664	-37,940	-4.1	-1.5
2021	5,197	-42,275	-4.5	-1.7
2022	5,197	-42,275	-4.5	-1.7
2023	5,197	-42,275	-4.5	-1.7
2024	5,197	-42,275	-4.5	-1.7
2025	5,197	-42,275	-4.5	-1.7
2026	5,197	-42,275	-4.5	-1.7

Electric Thermal Storage Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	70	8	-0.4	0.0
2013	175	19	-1.1	0.0
2014	280	30	-1.7	0.0
2015	385	41	-2.3	0.0
2016	490	53	-3.0	0.0
2017	595	64	-3.6	0.0
2018	700	75	-4.2	0.0
2019	805	87	-4.9	0.0
2020	910	98	-5.5	0.0
2021	1,015	109	-6.1	0.0
2022	1,120	121	-6.8	0.0
2023	1,225	132	-7.4	0.0
2024	1,330	143	-8.0	0.0
2025	1,435	154	-8.7	0.0
2026	1,540	166	-9.3	0.0

Direct Load Control of Residential Air Conditioners and Water Heaters*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	6,500	-301	-2.0	-8.4
2013	13,000	-603	-3.9	-16.8
2014	19,500	-904	-5.9	-25.3
2015	26,000	-1,205	-7.9	-33.7
2016	32,500	-1,507	-9.8	-42.1
2017	39,000	-1,808	-11.8	-50.5
2018	42,457	-1,968	-12.8	-55.0
2019	42,457	-1,968	-12.8	-55.0
2020	42,457	-1,968	-12.8	-55.0
2021	42,457	-1,968	-12.8	-55.0
2022	42,457	-1,968	-12.8	-55.0
2023	42,457	-1,968	-12.8	-55.0
2024	42,457	-1,968	-12.8	-55.0
2025	42,457	-1,968	-12.8	-55.0
2026	42,457	-1,968	-12.8	-55.0

Residential Lighting Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	77,000	-13,572	-2.0	-1.5
2013	146,000	-26,950	-4.0	-3.0
2014	207,000	-39,851	-6.0	-4.4
2015	257,000	-51,602	-7.7	-5.7
2016	307,000	-63,352	-9.5	-7.0
2017	357,000	-75,103	-11.3	-8.3
2018	407,000	-86,853	-13.0	-9.6
2019	457,000	-98,603	-14.8	-10.8
2020	430,000	-96,782	-14.5	-10.6
2021	411,000	-95,155	-14.3	-10.5
2022	350,000	-82,253	-12.3	-9.0
2023	300,000	-70,502	-10.6	-7.8
2024	250,000	-58,752	-8.8	-6.5
2025	200,000	-47,002	-7.1	-5.2
2026	150,000	-35,251	-5.3	-3.9

Touchstone Energy New Construction Home

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	573	-1,510	-1.3	-0.4
2013	1,221	-3,218	-2.8	-0.8
2014	1,933	-5,095	-4.5	-1.2
2015	2,663	-7,019	-6.1	-1.7
2016	3,406	-8,978	-7.9	-2.2
2017	4,158	-10,960	-9.6	-2.7
2018	4,914	-12,952	-11.3	-3.1
2019	5,670	-14,945	-13.1	-3.6
2020	6,448	-16,996	-14.9	-4.1
2021	7,227	-19,049	-16.7	-4.6
2022	7,993	-21,068	-18.5	-5.1
2023	8,771	-23,119	-20.2	-5.6
2024	9,545	-25,159	-22.0	-6.1
2025	10,336	-27,244	-23.9	-6.6
2026	11,133	-29,344	-25.7	-7.1

TSE Manufactured Home

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	34	-180	-0.1	0.0
2013	73	-386	-0.2	-0.1
2014	115	-609	-0.3	-0.1
2015	158	-836	-0.4	-0.1
2016	202	-1,069	-0.6	-0.2
2017	247	-1,308	-0.7	-0.2
2018	292	-1,546	-0.8	-0.3
2019	337	-1,784	-0.9	-0.3
2020	383	-2,028	-1.1	-0.3
2021	429	-2,271	-1.2	-0.4
2022	475	-2,515	-1.3	-0.4
2023	521	-2,758	-1.5	-0.5
2024	567	-3,002	-1.6	-0.5
2025	614	-3,251	-1.7	-0.6
2026	661	-3,499	-1.8	-0.6

Tune-Up HVAC with Duct Sealing Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	500	-448	-0.3	-0.1
2013	1,170	-1,049	-0.8	-0.3
2014	1,840	-1,650	-1.2	-0.5
2015	2,510	-2,251	-1.7	-0.6
2016	3,180	-2,852	-2.1	-0.8
2017	3,850	-3,453	-2.5	-1.0
2018	4,520	-4,054	-3.0	-1.1
2019	5,190	-4,655	-3.4	-1.3
2020	5,860	-5,255	-3.9	-1.4
2021	6,530	-5,856	-4.3	-1.6
2022	7,200	-6,457	-4.7	-1.8
2023	7,870	-7,058	-5.2	-1.9
2024	8,040	-7,211	-5.3	-2.0
2025	8,040	-7,211	-5.3	-2.0
2026	8,040	-7,211	-5.3	-2.0

Commercial Lighting Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,250	-4,597	-0.5	-0.9
2013	2,500	-9,195	-1.0	-1.8
2014	3,750	-13,792	-1.5	-2.8
2015	5,000	-18,389	-1.9	-3.7
2016	6,250	-22,986	-2.4	-4.6
2017	7,500	-27,584	-2.9	-5.5
2018	8,750	-32,181	-3.4	-6.4
2019	10,000	-36,778	-3.9	-7.4
2020	11,250	-41,376	-4.4	-8.3
2021	12,500	-45,973	-4.9	-9.2
2022	12,500	-45,973	-4.9	-9.2
2023	12,500	-45,973	-4.9	-9.2
2024	12,500	-45,973	-4.9	-9.2
2025	12,500	-45,973	-4.9	-9.2
2026	12,500	-45,973	-4.9	-9.2

Compressed Air Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,560	-5,761	-0.5	-1.1
2013	3,640	-13,442	-1.1	-2.7
2014	5,720	-21,123	-1.7	-4.2
2015	7,800	-28,805	-2.3	-5.7
2016	9,880	-36,486	-2.9	-7.2
2017	11,960	-44,167	-3.5	-8.7
2018	14,040	-51,848	-4.1	-10.2
2019	14,560	-53,769	-4.2	-10.6
2020	14,560	-53,769	-4.2	-10.6
2021	14,560	-53,769	-4.2	-10.6
2022	14,560	-53,769	-4.2	-10.6
2023	14,560	-53,769	-4.2	-10.6
2024	14,560	-53,769	-4.2	-10.6
2025	14,560	-53,769	-4.2	-10.6
2026	14,560	-53,769	-4.2	-10.6

Gallatin Steel Interruptible

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1	0	-120.0	-120.0
2013	1	0	-120.0	-120.0
2014	1	0	-120.0	-120.0
2015	1	0	-120.0	-120.0
2016	1	0	-120.0	-120.0
2017	1	0	-120.0	-120.0
2018	1	0	-120.0	-120.0
2019	1	0	-120.0	-120.0
2020	1	0	-120.0	-120.0
2021	1	0	-120.0	-120.0
2022	1	0	-120.0	-120.0
2023	1	0	-120.0	-120.0
2024	1	0	-120.0	-120.0
2025	1	0	-120.0	-120.0
2026	1	0	-120.0	-120.0

Interruptible Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	4	0	-8.0	-8.0
2013	4	0	-8.0	-8.0
2014	4	0	-8.0	-8.0
2015	4	0	-8.0	-8.0
2016	4	0	-8.0	-8.0
2017	4	0	-8.0	-8.0
2018	4	0	-8.0	-8.0
2019	4	0	-8.0	-8.0
2020	4	0	-8.0	-8.0
2021	4	0	-8.0	-8.0
2022	4	0	-8.0	-8.0
2023	4	0	-8.0	-8.0
2024	4	0	-8.0	-8.0
2025	4	0	-8.0	-8.0
2026	4	0	-8.0	-8.0

New:
“Beat the Peak” Demand Response Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	8,000	-130	-1.7	-1.7
2013	16,000	-259	-3.5	-3.5
2014	24,000	-389	-5.2	-5.2
2015	32,000	-518	-6.9	-6.9
2016	40,000	-648	-8.6	-8.6
2017	40,000	-648	-8.6	-8.6
2018	40,000	-648	-8.6	-8.6
2019	40,000	-648	-8.6	-8.6
2020	40,000	-648	-8.6	-8.6
2021	40,000	-648	-8.6	-8.6
2022	40,000	-648	-8.6	-8.6
2023	40,000	-648	-8.6	-8.6
2024	40,000	-648	-8.6	-8.6
2025	40,000	-648	-8.6	-8.6
2026	40,000	-648	-8.6	-8.6

ENERGY STAR Residential Central Air Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	2,600	-1,337	0.0	-1.2
2013	5,200	-2,674	0.0	-2.5
2014	7,800	-4,011	0.0	-3.7
2015	10,400	-5,348	0.0	-5.0
2016	13,000	-6,684	0.0	-6.2
2017	15,600	-8,021	0.0	-7.4
2018	18,200	-9,358	0.0	-8.7
2019	20,800	-10,695	0.0	-9.9
2020	23,400	-12,032	0.0	-11.1
2021	26,000	-13,369	0.0	-12.4
2022	28,600	-14,706	0.0	-13.6
2023	31,200	-16,043	0.0	-14.9
2024	33,800	-17,380	0.0	-16.1
2025	36,400	-18,716	0.0	-17.3
2026	39,000	-20,053	0.0	-18.6

Residential Geothermal Retrofit program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	200	-1,502	-1.2	-0.5
2013	400	-3,003	-2.4	-1.0
2014	600	-4,505	-3.7	-1.5
2015	800	-6,007	-4.9	-1.9
2016	1,000	-7,508	-6.1	-2.4
2017	1,000	-7,508	-6.1	-2.4
2018	1,000	-7,508	-6.1	-2.4
2019	1,000	-7,508	-6.1	-2.4
2020	1,000	-7,508	-6.1	-2.4
2021	1,000	-7,508	-6.1	-2.4
2022	1,000	-7,508	-6.1	-2.4
2023	1,000	-7,508	-6.1	-2.4
2024	1,000	-7,508	-6.1	-2.4
2025	1,000	-7,508	-6.1	-2.4
2026	1,000	-7,508	-6.1	-2.4

Home Energy Information Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	100,000	-30,534	-8.2	-6.4
2013	100,000	-30,534	-8.2	-6.4
2014	100,000	-30,534	-8.2	-6.4
2015	100,000	-30,534	-8.2	-6.4
2016	100,000	-30,534	-8.2	-6.4
2017	100,000	-30,534	-8.2	-6.4
2018	100,000	-30,534	-8.2	-6.4
2019	100,000	-30,534	-8.2	-6.4
2020	100,000	-30,534	-8.2	-6.4
2021	100,000	-30,534	-8.2	-6.4
2022	100,000	-30,534	-8.2	-6.4
2023	100,000	-30,534	-8.2	-6.4
2024	100,000	-30,534	-8.2	-6.4
2025	100,000	-30,534	-8.2	-6.4
2026	100,000	-30,534	-8.2	-6.4

Low Income Weatherization Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,500	-4,862	-3.4	-1.5
2013	3,000	-9,723	-6.8	-3.0
2014	4,500	-14,585	-10.3	-4.5
2015	6,000	-19,446	-13.7	-6.0
2016	7,500	-24,308	-17.1	-7.5
2017	9,000	-29,170	-20.5	-9.0
2018	10,500	-34,031	-23.9	-10.5
2019	12,000	-38,893	-27.3	-12.1
2020	13,500	-43,755	-30.8	-13.6
2021	15,000	-48,616	-34.2	-15.1
2022	16,500	-53,478	-37.6	-16.6
2023	18,000	-58,339	-41.0	-18.1
2024	19,500	-63,201	-44.4	-19.6
2025	21,000	-68,063	-47.9	-21.1
2026	22,500	-72,924	-51.3	-22.6

Mobile Home Retrofit Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	500	-1,714	-0.9	-0.2
2013	1,000	-3,428	-1.8	-0.5
2014	1,500	-5,142	-2.6	-0.7
2015	2,000	-6,856	-3.5	-1.0
2016	2,500	-8,570	-4.4	-1.2
2017	3,000	-10,284	-5.3	-1.5
2018	3,500	-11,998	-6.2	-1.7
2019	4,000	-13,712	-7.1	-2.0
2020	4,500	-15,426	-7.9	-2.2
2021	5,000	-17,140	-8.8	-2.4
2022	5,500	-18,854	-9.7	-2.7
2023	6,000	-20,568	-10.6	-2.9
2024	6,000	-20,568	-10.6	-2.9
2025	6,000	-20,568	-10.6	-2.9
2026	6,000	-20,568	-10.6	-2.9

Programmable Thermostat Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	600	-420	0.0	-0.1
2013	1,200	-840	0.0	-0.2
2014	1,800	-1,260	0.0	-0.2
2015	2,400	-1,680	0.0	-0.3
2016	3,000	-2,100	0.0	-0.4
2017	3,600	-2,519	0.0	-0.5
2018	4,200	-2,939	0.0	-0.5
2019	4,800	-3,359	0.0	-0.6
2020	5,400	-3,779	0.0	-0.7
2021	6,000	-4,199	0.0	-0.8
2022	6,000	-4,199	0.0	-0.8
2023	6,000	-4,199	0.0	-0.8
2024	6,000	-4,199	0.0	-0.8
2025	6,000	-4,199	0.0	-0.8
2026	6,000	-4,199	0.0	-0.8

DLC for Residential Pool Pump

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,500	-31	0.0	-1.2
2013	3,000	-62	0.0	-2.4
2014	4,500	-93	0.0	-3.6
2015	6,000	-124	0.0	-4.9
2016	7,500	-156	0.0	-6.1
2017	7,500	-156	0.0	-6.1
2018	7,500	-156	0.0	-6.1
2019	7,500	-156	0.0	-6.1
2020	7,500	-156	0.0	-6.1
2021	7,500	-156	0.0	-6.1
2022	7,500	-156	0.0	-6.1
2023	7,500	-156	0.0	-6.1
2024	7,500	-156	0.0	-6.1
2025	7,500	-156	0.0	-6.1
2026	7,500	-156	0.0	-6.1

Advanced Weatherization Tier 2*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	-	0	0.0	0.0
2013	75	-333	-0.2	-0.1
2014	225	-999	-0.7	-0.2
2015	375	-1,665	-1.1	-0.4
2016	525	-2,331	-1.6	-0.5
2017	675	-2,997	-2.0	-0.7
2018	825	-3,663	-2.5	-0.8
2019	975	-4,329	-2.9	-1.0
2020	1,125	-4,995	-3.4	-1.1
2021	1,275	-5,661	-3.8	-1.3
2022	1,425	-6,326	-4.3	-1.4
2023	1,575	-6,992	-4.8	-1.6
2024	1,725	-7,658	-5.2	-1.7
2025	1,875	-8,324	-5.7	-1.9
2026	2,025	-8,990	-6.1	-2.0

Advanced Weatherization Tier 3*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	-	0	0.0	0.0
2013	50	-296	-0.2	-0.1
2014	150	-888	-0.6	-0.2
2015	250	-1,480	-1.0	-0.3
2016	350	-2,072	-1.4	-0.5
2017	450	-2,664	-1.8	-0.6
2018	550	-3,256	-2.2	-0.7
2019	650	-3,848	-2.6	-0.9
2020	750	-4,440	-3.0	-1.0
2021	850	-5,032	-3.4	-1.1
2022	950	-5,624	-3.8	-1.3
2023	1,050	-6,215	-4.2	-1.4
2024	1,150	-6,807	-4.6	-1.5
2025	1,250	-7,399	-5.0	-1.7
2026	1,350	-7,991	-5.4	-1.8

ENERGY STAR Clothes Washer program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	2,225	-759	-0.2	-0.1
2013	4,450	-1,518	-0.3	-0.1
2014	6,675	-2,277	-0.5	-0.2
2015	8,900	-3,036	-0.6	-0.3
2016	11,125	-3,796	-0.8	-0.3
2017	13,350	-4,555	-0.9	-0.4
2018	15,575	-5,314	-1.1	-0.5
2019	17,800	-6,073	-1.2	-0.5
2020	20,025	-6,832	-1.4	-0.6
2021	22,250	-7,591	-1.5	-0.6
2022	24,475	-8,350	-1.7	-0.7
2023	26,700	-9,109	-1.8	-0.8
2024	26,700	-9,109	-1.8	-0.8
2025	26,700	-9,109	-1.8	-0.8
2026	26,700	-9,109	-1.8	-0.8

C&I Demand Response Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	150	-1,740	-5.7	-5.7
2013	350	-4,061	-13.2	-13.2
2014	500	-5,801	-18.9	-18.9
2015	500	-5,801	-18.9	-18.9
2016	500	-5,801	-18.9	-18.9
2017	500	-5,801	-18.9	-18.9
2018	500	-5,801	-18.9	-18.9
2019	500	-5,801	-18.9	-18.9
2020	500	-5,801	-18.9	-18.9
2021	500	-5,801	-18.9	-18.9
2022	500	-5,801	-18.9	-18.9
2023	500	-5,801	-18.9	-18.9
2024	500	-5,801	-18.9	-18.9
2025	500	-5,801	-18.9	-18.9
2026	500	-5,801	-18.9	-18.9

Industrial Process Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	3	-7,771	-2.1	-2.5
2013	6	-15,542	-4.2	-5.1
2014	9	-23,313	-6.2	-7.6
2015	12	-31,084	-8.3	-10.2
2016	15	-38,854	-10.4	-12.7
2017	18	-46,625	-12.5	-15.3
2018	21	-54,396	-14.6	-17.8
2019	24	-62,167	-16.6	-20.4
2020	27	-69,938	-18.7	-22.9
2021	30	-77,709	-20.8	-25.5
2022	30	-77,709	-20.8	-25.5
2023	30	-77,709	-20.8	-25.5
2024	30	-77,709	-20.8	-25.5
2025	30	-77,709	-20.8	-25.5
2026	30	-77,709	-20.8	-25.5

Industrial Variable Speed Drives Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	53	-4,787	-0.4	-0.5
2013	106	-9,575	-0.7	-1.0
2014	159	-14,362	-1.1	-1.5
2015	212	-19,150	-1.5	-2.1
2016	265	-23,937	-1.9	-2.6
2017	318	-28,725	-2.2	-3.1
2018	371	-33,512	-2.6	-3.6
2019	424	-38,300	-3.0	-4.1
2020	477	-43,087	-3.4	-4.6
2021	530	-47,875	-3.7	-5.2
2022	583	-52,662	-4.1	-5.7
2023	636	-57,449	-4.5	-6.2
2024	689	-62,237	-4.9	-6.7
2025	742	-67,024	-5.2	-7.2
2026	795	-71,812	-5.6	-7.7

Commercial EMCS Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	60	-1,750	-0.4	-0.2
2013	120	-3,499	-0.7	-0.4
2014	180	-5,249	-1.1	-0.6
2015	240	-6,998	-1.4	-0.9
2016	300	-8,748	-1.8	-1.1
2017	360	-10,498	-2.1	-1.3
2018	420	-12,247	-2.5	-1.5
2019	480	-13,997	-2.8	-1.7
2020	540	-15,746	-3.2	-1.9
2021	600	-17,496	-3.5	-2.2
2022	660	-19,246	-3.9	-2.4
2023	720	-20,995	-4.2	-2.6
2024	780	-22,745	-4.6	-2.8
2025	840	-24,494	-4.9	-3.0
2026	900	-26,244	-5.3	-3.2

DLC for Commercial Central AC

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,200	-38	0.0	-2.6
2013	2,400	-76	0.0	-5.2
2014	3,600	-115	0.0	-7.8
2015	4,800	-153	0.0	-10.4
2016	6,000	-191	0.0	-13.0
2017	6,000	-191	0.0	-13.0
2018	6,000	-191	0.0	-13.0
2019	6,000	-191	0.0	-13.0
2020	6,000	-191	0.0	-13.0
2021	6,000	-191	0.0	-13.0
2022	6,000	-191	0.0	-13.0
2023	6,000	-191	0.0	-13.0
2024	6,000	-191	0.0	-13.0
2025	6,000	-191	0.0	-13.0
2026	6,000	-191	0.0	-13.0

Commercial Building Performance Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	300	-3,786	-0.8	-0.9
2013	600	-7,572	-1.5	-1.9
2014	900	-11,358	-2.3	-2.8
2015	1,200	-15,144	-3.0	-3.7
2016	1,500	-18,930	-3.8	-4.7
2017	1,800	-22,716	-4.5	-5.6
2018	2,100	-26,502	-5.3	-6.5
2019	2,100	-26,502	-5.3	-6.5
2020	2,100	-26,502	-5.3	-6.5
2021	2,100	-26,502	-5.3	-6.5
2022	2,100	-26,502	-5.3	-6.5
2023	2,100	-26,502	-5.3	-6.5
2024	2,100	-26,502	-5.3	-6.5
2025	2,100	-26,502	-5.3	-6.5
2026	2,100	-26,502	-5.3	-6.5

Commercial Duct Sealing Program*(negative value = reduction in load)*

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	1,000	-2,430	-0.5	-0.6
2013	2,000	-4,860	-1.0	-1.2
2014	3,000	-7,290	-1.5	-1.8
2015	4,000	-9,720	-1.9	-2.4
2016	5,000	-12,150	-2.4	-3.0
2017	6,000	-14,580	-2.9	-3.6
2018	7,000	-17,010	-3.4	-4.2
2019	8,000	-19,440	-3.9	-4.8
2020	9,000	-21,870	-4.4	-5.4
2021	10,000	-24,300	-4.9	-6.0
2022	11,000	-26,730	-5.4	-6.6
2023	12,000	-29,160	-5.8	-7.2
2024	13,000	-31,590	-6.3	-7.8
2025	14,000	-34,020	-6.8	-8.4
2026	15,000	-36,450	-7.3	-9.0

Commercial Efficient HVAC Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	800	-1,257	-0.2	-0.3
2013	1,600	-2,515	-0.4	-0.7
2014	2,400	-3,772	-0.6	-1.0
2015	3,200	-5,030	-0.8	-1.3
2016	4,000	-6,287	-1.0	-1.7
2017	4,800	-7,544	-1.2	-2.0
2018	5,600	-8,802	-1.3	-2.3
2019	6,400	-10,059	-1.5	-2.7
2020	7,200	-11,316	-1.7	-3.0
2021	8,000	-12,574	-1.9	-3.3
2022	8,800	-13,831	-2.1	-3.7
2023	9,600	-15,089	-2.3	-4.0
2024	10,400	-16,346	-2.5	-4.3
2025	11,200	-17,603	-2.7	-4.7
2026	12,000	-18,861	-2.9	-5.0

Commercial New Construction Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	440	-5,987	-0.9	-1.6
2013	880	-11,973	-1.9	-3.3
2014	1,320	-17,960	-2.8	-4.9
2015	1,760	-23,947	-3.8	-6.6
2016	2,200	-29,933	-4.7	-8.2
2017	2,640	-35,920	-5.6	-9.8
2018	3,080	-41,907	-6.6	-11.5
2019	3,520	-47,893	-7.5	-13.1
2020	3,960	-53,880	-8.5	-14.8
2021	4,400	-59,867	-9.4	-16.4
2022	4,840	-65,853	-10.4	-18.0
2023	5,280	-71,840	-11.3	-19.7
2024	5,720	-77,827	-12.2	-21.3
2025	6,160	-83,813	-13.2	-23.0
2026	6,600	-89,800	-14.1	-24.6

Small C&I Audit Program

(negative value = reduction in load)

Year	Participants	Impact on Total Requirements (MWh)	Impact on Winter Peak (MW)	Impact on Summer Peak (MW)
2012	300	-1,201	-0.2	-0.3
2013	600	-2,403	-0.5	-0.6
2014	900	-3,604	-0.7	-0.9
2015	1,200	-4,805	-1.0	-1.2
2016	1,500	-6,006	-1.2	-1.5
2017	1,800	-7,208	-1.4	-1.8
2018	2,100	-8,409	-1.7	-2.1
2019	2,400	-9,610	-1.9	-2.4
2020	2,700	-10,812	-2.2	-2.7
2021	3,000	-12,013	-2.4	-3.0
2022	3,000	-12,013	-2.4	-3.0
2023	3,000	-12,013	-2.4	-3.0
2024	3,000	-12,013	-2.4	-3.0
2025	3,000	-12,013	-2.4	-3.0
2026	3,000	-12,013	-2.4	-3.0