Kentucky Power Company (KPCO)

Demand Side Management Program Plan

Final Report

Applied Energy Group, Inc.
317 George Street
Suite 305
New Brunswick, NJ 08901
732.246.5700
www.appliedenergygroup.com

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Kentucky Power Company

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This report was prepared by

Applied Energy Group, Inc.
317 George Street, Suite 305
New Brunswick, NJ 08901

Project Director: I. Rohmund
Project Manager: A. Cottrell
Market Research: D. Lineweber
Program Design: E. Coughlin
Modeling (Commercial, Demand Response): V. Nielsen
Modeling (Residential, Industrial): J. Reilly

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SECTION | 1

Introduction

Kentucky Power Company (KPCO or Kentucky Power) is an investor-owned, regulated utility that serves approximately 175,000 electric customers in all or part of 20 eastern Kentucky counties.[1] The utility is part of the American Electric Power (AEP) system, which is one of the largest electric utilities in the United States.[2] Kentucky Power's Demand Side Management (DSM) Program Plan is implemented to help reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services. KPCO's existing portfolio is comprised of a mix of residential and commercial programs, providing a variety of opportunities for customers.

KPCO contracted with Applied Energy Group (AEG) to conduct an Energy Efficiency Market Potential Study covering the period of performance from 2016 through 2025 to aid the development of a 10-year Program Plan. The comprehensive study includes primary market research, a full demand side management potential analysis for electricity, energy efficiency program design and demand response options.

The DSM Program Plan was designed to build upon Kentucky Power's existing programs, incorporating the primary market research, DSM potential analysis and best-practices. This report presents the KPCO DSM Program Plan, including the delivery framework, budget, projected impacts, and cost-effectiveness for the DSM offerings from 2016 through 2025.

[1] Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/
[2] American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

SECTION | 2

Analysis Approach

The DSM Program Plan is based upon the combination of KPCO's existing DSM portfolio, the DSM potential study, and a multi-criteria program development selection approach. Criteria included the potential study, analysis of other utility programs, cost-effectiveness, and stakeholder input.

The two tenets that guide the design of Kentucky Power's programs are:

- **The service territory benefits from energy efficiency programs**. As part of the overall strategy for meeting the needs of its customers, cost-effective energy-efficiency programs offer an alternative to the construction of infrastructure and purchase of fuel for generation.
- **KPCO customers benefit from energy efficiency programs.** Energy efficiency can result in lower energy bills, immediately reducing program participant's consumption of electricity. Furthermore, the programs are designed to be inclusive, giving all customers the opportunity to benefit from participating in the energy efficiency programs.

The energy efficiency portfolio design includes 2016 through 2025. AEG performed the industry standard cost-effectiveness tests in order to gauge the economic merits of the measures, programs and portfolio. Each test compares the benefits of a DSM program to its costs using its own unique perspectives and definitions. The definitions for the four standard tests most commonly used are described below.

- **Total Resource Cost (TRC) Test**: Comparison of program administrator and customer costs to utility resource savings. Will the total costs of energy in the utility service territory decrease?
- **Participant Cost Test**: Compares customer costs and benefits of installing the measure. Will the participant benefit over the life of the measure?
- **Utility Cost Test**: Comparison of program administrator costs to supply-side resource benefits. Will utility costs to save energy be less than utility costs to deliver the same amount of energy?
- **Ratepayer Impact Measure (RIM) Test**: Measures the impact of the DSM Program on utility rates if rates were to be adjusted to account for the program. Comparison of utility program costs and bill reductions associated with energy savings to supply-side resource benefits. Will customer rates increase?

The software used to perform the cost-effectiveness has been adapted from Minnesota Office of Energy Security "BenCost" software and is consistent with the California Standard Practice Manual. The input data gathered for the model are described in Table 2-1.

Table 2-1 Benefit-Cost Model Inputs [3]

General Inputs	Project-Specific Inputs
Electric Retail Rate ($/kWh)	Utility Project Costs (Administrative & Incentives)
Natural Gas Retail Rate ($/therm)	Direct Participant Project Costs ($/Participant)
Commodity Cost ($/kWh)	Project Life (Years)
Demand Cost ($/kW-Year)	kWh/Participant Saved (Net and Gross)
Discount Rate (%)	kW/Participant Saved (Net and Gross)
Growth Rate (%)	Therm/Participant Saved (Net and Gross)
Line Losses (%)	Number of Participants

Savings estimates for individual measures and programs were developed using a variety of sources. Kentucky-specific data was utilized where available, with regional and national data filling the information gaps. Impact savings were calculated using generally accepted engineering algorithms based on a set of reasonable assumptions. Because of the diversity in equipment and energy consumption patterns across multiple building types and end-uses, there exists a variability in these savings estimates as they relate to program design and target markets, particularly at the planning stage of these programs.

Measure-level cost-effectiveness was calculated utilizing the TRC Test. Measure-level cost-effectiveness does not account for program administrative costs as they are spent at the program-level and cannot be allocated to specific measure. Measures that were cost-effective on a stand-alone basis were bundled into programs and re-screened for cost-effectiveness. The programs and portfolio were designed to be cost-effective. Measures were bundled based on the end-use, sector and implementation.

[3] See Appendix A.

SECTION | 3

DSM Portfolio Framework

DSM portfolios are typically implemented using a combination of in-house resources and outsourced implementation contractors. On one end of the spectrum are completely outsourced initiatives, where an implementation contractor delivers all DSM programs on behalf of the utility. On the other end of the spectrum are completely in-house initiatives that rely solely on utility staff and personnel. Utilities typically utilize a combination of in-house resources and a network of contractors and vendors that may provide additional expertise or economies of scale.

Kentucky Power currently manages half of their programs in-house and utilizes contractors to implement the remaining programs with in-house staff overseeing implementation activities. The program design process considered the current DSM portfolio delivery structure to determine which programs would benefit from being run in-house versus by an implementation contractor. AEG considered factors such as cost-effectiveness, budget, and Kentucky Power staff time constraints and feasibility.

Program Participation and Eligibility

Program eligibility has been defined broadly to make programs as inclusive as possible. For most residential programs, eligible participants include customers living in every type of residential structure, including single-family, multi-family and manufactured homes. For specific programs, customers who have recently participated in a KPCO program may be limited because repeated participation would not render sufficient savings to justify the expense. In general, however, participation guidelines are designed to include all customer sectors and end uses.[4]

Dealer Network

Dealers are contractors that execute energy efficiency initiatives in cooperation with Kentucky Power's DSM portfolio. Developing an educated and qualified dealer network is a key element to creating market transformation. Dealers are often the first point of contact for a customer in need of new equipment/system. For example, a residential customer who needs to replace HVAC equipment often contacts a dealer. Therefore, dealers have a unique opportunity to make customers aware of Kentucky Power's DSM programs and educate the customer on the benefits of energy efficient equipment/systems. Kentucky Power has developed a successful network of dealers that deliver existing residential DSM programs. The implementation contractor(s) will continue to expand the dealer network and work with the dealers to successfully market the DSM programs and educate customers.

Outreach, Marketing and Communications

Outreach, marketing and communications are critical mechanisms for ensuring customers and dealers are aware of, and participate in, the portfolio of programs. The DSM program portfolio relies on a combination of education and customer incentives to advance energy efficiency. The programs have been designed to maximize participation given best practices. Educating customers and dealers on the benefits of energy efficiency can speed the adoption of energy efficient measures and promote market transformation.

Customer incentives are the primary mechanism for program delivery. Through this mechanism, customers receive rebates to purchase energy efficient equipment and services through existing

[4] Customer sectors account for only those sectors that pay the DSM charge.

market actors including contractors, equipment dealers and retailers. To achieve the portfolio's long-term savings goals, it is be necessary for Kentucky Power and the implementation contractors to engage customers, dealers, and state and local agencies. Targeting dealers and leveraging Kentucky Power's relationships with stakeholders increases program awareness and promote the market adoption of high efficiency equipment/systems.

DSM program outreach, marketing and communication activities may include a mix of:

- The Kentucky Power website, which should act as a central location and portal for customer and dealer participation, providing up-to-date access on DSM program, incentive offerings, rebate applications, etc.
- Television, radio, print, direct mail, and magazine advertisements.
- News story press releases resulting in newspaper and television news stories.
- Brochures and literature.
- Outreach, education seminars, and speaking events.
- E-mails, newsletters, round tables, and customizable brochures for dealers.
- Kentucky Power's Customer Operation Center, answer general customer inquiries.

Outreach, marketing and communications will be discussed in more detail within the program descriptions later in this report.

A portion of the education and marketing budget from each individual DSM program is directed toward coordinating the overall strategy in a concerted way that reinforces the Kentucky Power DSM Program Plan.

Portfolio Risk Management

The DSM portfolio incorporates multiple strategies to manage risk, including:

- Diversification of offerings among multiple programs and customer groups.
- KPCO's rigorous RFP and performance-contracting process to select and appropriately guide implementation contractors.
- Minimize free ridership and maximize spillover through using proven, best practice measures,[5] program delivery mechanisms, etc.
- Conduct periodic evaluations and incorporate the resulting recommendations for process improvements as they are received.

Minimize Net-to-Gross Impacts

Net-to-Gross (NTG) ratios adjust the gross energy and demand savings associated with a program to reflect the overall effectiveness of the program, taking into account free riders and spillover. Free riders and spillover, as determined from an impact evaluation, are defined as:

- **Free Riders**: Customers who participate in energy efficiency programs that would have engaged in the efficient behavior in the absence of the program. The inclusion of free riders overestimates the energy and demand savings associated with a program.
- **Spillover**: Customers who engage in energy efficient behavior due to some influence of a program but who do not participate in a program. For example, if a customer purchases a CFL bulb through the KPCO Residential Efficient Products Program and then chooses to purchase an ENERGY STAR® clothes dryer after learning about the benefits of energy efficiency.

[5] U.S. Environmental Protection Agency. National Action Plan for Energy Efficiency. www.epa.gov/cleanenergy/energy-programs/suca/resources.html

Spillover and free ridership act in opposing directions, with spillover increasing a program's energy and demand savings while free ridership diminishes a program's savings.

Kentucky Power should make an effort to minimize free ridership and maximize spillover by,

- Modifying incentives to respond to market conditions, as needed and practical.
- Verifying customer eligibility to ensure the customer is a KPCO customer, as practical.
- Increasing marketing of KPCO's DSM portfolio.

Kentucky Power program adjustments to address free ridership and spillover should not negatively impact program implementation or continuity (e.g. Kentucky Power should not modify incentive levels with a frequency that would compromise program stability and the customer experience). Kentucky Power should work with program implementation contractors as well as the evaluation contractor(s) to determine if additional action is needed to minimize free ridership and maximize spillover.

Evaluation, Measurement and Verification

Evaluation, measurement, and verification (EM&V) is designed to support the need for public accountability, oversight and cost-effective program improvements and documentation of the effects of ratepayer funded efficiency programs. Kentucky Power should engage an EM&V contractor(s) to conduct process and impact evaluations of the DSM programs. It is important in the program design phase to allocate a sufficient amount of budget for strategic process evaluations and statistically significant impact evaluations to be performed at appropriate intervals on the relevant portions of the portfolio.

EM&V is recommended on a three-year rotating schedule. A process and impact evaluation should be conducted on each program during the three-year program cycle. The EM&V budget is presented within the report on an annual basis but may be spent at any point during the program cycle. The process and impact evaluations need not be conducted at the same time. Process evaluations are typically conducted earlier in the program cycle so that any issues uncovered can be addressed immediately, ensuring optimal program performance. Impact evaluations are typically conducted later in the program cycle when program results are accessible and apparent.

Process Evaluations

Process evaluations ensure that a program is operating as intended and provides information that can enable improvements in both the program design and implementation. Process evaluations assess customer understanding, attitudes about, and satisfaction with the program and other educational activities. The EM&V contractor assesses the effectiveness of the marketing and outreach, dealer involvement, and whether implementation milestones are met adequately and on schedule. These evaluations use sales and promotion data maintained by the tracking system as well as customer survey data.

A good process evaluation:

- Assists program implementers and managers structure programs to achieve cost-effective savings while maintaining high levels of customer satisfaction.
- Determines awareness levels to refine marketing strategies and reduce barriers to participation.
- Provides recommendations for changing the program's structure, management, administration, design, delivery, operations or targets.
- Determines if specific best practices should be incorporated.

Impact Evaluations

Impact evaluations estimate gross and net demand, energy savings and the cost-effectiveness of installed systems. They are used to verify measure installations, identify key energy assumptions and provide the research necessary to calculate defensible and accurate savings attributable to the

program. The selected EM&V contractor develops an evaluation plan that ensures the appropriate measurement of savings in compliance with industry protocols. The impact evaluation also includes an evaluation of net-to-gross components.

Budget Categories

Budget flexibility is important in order to effectively implement programs over multiple years. Kentucky Power should have the flexibility to move budget dollars between programs and customer segments with cost effective program operation assuming Kentucky Power does not incur costs in excess of 115 percent of the overall annual budget. This flexibility allows Kentucky Power to focus on providing their customers the most cost-effective programs that are implemented efficiently and minimize costs to ratepayers.

The portfolio budget is the aggregate of the individual program budgets and cross-cutting budgets. The program budgets are comprised of five budget categories:

- **Incentives:** Dollars given to customers in the form of rebates, incentives or instant discounts. The incentives are proposed for planning purposes and may be modified by the implementation contractor or Kentucky Power to reflect market conditions.
- **Delivery:** Implementation contractors should be hired to deliver Kentucky Power's DSM programs. The delivery costs vary by program, but typically include dealer engagement, rebate processing, quality assurance/quality control activities, marketing, performance incentives and reporting.
- **Measure Costs:** Investment on measures that are directly installed in customer's homes at no cost to the customer.
- **Marketing:** Implementation contractor costs associated with marketing, outreach and education of customers and dealers, as applicable.
- **IT Reporting:** Costs associated with a portfolio tracking system and DSM management to accurately and expeditiously integrate data for managing DSM services and track program expenditures, participation and savings.
- **Vendor Incentives:** A direct payment to dealers that install qualifying energy efficient equipment through a Kentucky Power DSM program.
- **Evaluation:** EM&V costs associated with program process and impact evaluations.

A portion of the budget has been set aside for cross-cutting portfolio marketing and education activities. Implementation contractors are responsible for program marketing and education activities targeting customers and program dealers. Kentucky Power is responsible for marketing the portfolio and/or multiple programs through a variety of marketing tactics that may include, but not be limited to: radio advertisements, bill inserts, and the Kentucky Power website. The general marketing and education budget will be utilized for these portfolio/cross-program marketing and education activities.

SECTION | 4

Proposed DSM Program Plan

AEG developed three DSM Program Plan scenarios:[6]

- **High Scenario** reflects expected program participation given ideal market implementation and few barriers to customer adoption. Information channels are assumed to be established and efficient for marketing, educating consumers, and coordinating with dealers and delivery partners. Under this scenario, incentives represent a substantial portion of the incremental cost combined with high administrative and marketing costs. The scenario assumes that industrial customers are very likely to participate in the Kentucky DSM portfolio.[7]
- **Mid-Scenario** reflects expected program participation given barriers to customer acceptance and non-ideal implementation conditions. These measures are delivered under less than ideal market conditions, however, there are less barriers and less limitations on budgets than there would be under the low scenario. This scenario represents the program design proposed for implementation in 2016 through 2018.
- **Low Scenario** reflects low program participation given high barriers to customer acceptance, non-ideal implementation conditions, limited program budgets and limited access to support for implementation as well as education and outreach.

The proposed Kentucky Power DSM Program Plan delivers an effective and balanced portfolio of energy and peak demand savings opportunities across all customer segments. Each program was designed to leverage the optimal mix of best-practice measures and technologies, delivery strategies, and target markets in order to most effectively deliver programs and measures to KPCO customers.

Two existing programs are not included in the proposed Kentucky Power DSM Program Plans:

Student Energy Education. Kentucky Power partnered with the National Energy Education Development Project (NEED) to offer free classroom instruction and educational materials to help 7th grade students learn about energy, electricity, the environment and economic issues. All schools with 7th grade students within Kentucky Power's service territory were eligible to participate.

The program is not recommended beginning in 2016. The existing delivery strategy extends the available resources of The Kentucky Power DSM staff who is responsible for outreach and education, teacher/educator development and delivering CFL bulbs to each school within the 20 county utility service area in eastern Kentucky. The program was not cost-effective when outsourced implementation costs were factored into the program costs.

Community Outreach CFL. Kentucky Power distributed CFLs to customers at company-sponsored community events. Customers provided a copy of their Kentucky Power electric bill before they were provided the bulbs to ensure eligibility. The community events were held throughout Kentucky Power's service territory over the year.

The program is not recommended beginning in 2016. The existing delivery strategy extends the available resources of The Kentucky Power DSM staff who is responsible for coordinating and staffing the events as well as delivering the CFL bulbs to each event. The program was not cost-effective when outsourced implementation costs were factored into the program costs.

[6] Actual program participation achievements may range +/- 20% of the program participation projected for modeling purposes. Actual participation is dependent upon a variety of factors, many of which cannot be anticipated during the program design phase (e.g. an economic downturn that causes customers to limit spending on extraneous actions, such as energy efficiency).
[7] Currently, the industrial customers opt-out of the DSM charge.

The programs included in at least one of the three DSM Program Plan scenarios are listed with a brief description in Table 4-1.

Table 4-1 Proposed DSM Program Descriptions

Residential DSM Programs	
Residential Efficient Products	The program is comprised of 2 components: • Upstream incentives at qualifying retailers for CFLs and LEDs. • Mail-in rebates for qualifying efficient appliances.
Appliance Recycling	Incentives for recycling older, working refrigerators or freezers.
New Manufactured Homes	Incentives for the purchase of a new manufactured home with (1) Zone 3 insulation and a high efficiency heat pump or (2) ENERGY STAR® certified.
Whole House Efficiency	The program is comprised of three program offerings: • *Home Energy Audit*. Free home energy audit and direct installation of energy conservation measures. • *Weatherization*. Incentives for air sealing and insulation. • *HVAC*. Incentives for qualifying HVAC equipment.
Residential Home Performance	Behavior program utilizing customized energy reports sent periodically to households.
Targeted Energy Efficiency	Weatherization and energy efficiency services provided to customers that do not exceed the designated federal poverty guidelines.
Commercial & Industrial DSM Programs	
Commercial Incentive Program	Commercial customers may receive incentives for prescriptive or custom measures.
Express Install	Small commercial customers receive 70% of the full cost of qualifying measures.
New Construction	Commercial customer incentives for adopting qualified energy efficiency improvements and technology in new construction or major renovation projects.
Bid for Efficiency	KPCO purchases blocks of electricity savings representing reduced electric usage from eligible commercial customers or third parties working with eligible commercial customers.
School Energy Manager	Fund a school energy manager program to provide energy management services to eligible school districts.
Retro-Commissioning	Large commercial customers receive funding for a study to optimize current systems and improve control strategies.

Figure 4-1 below presents the proposed annual budgets (in thousands of dollars) and energy savings (in MWh saved) for each scenario. The detailed program budgets, energy savings and demand savings by scenario are presented in the subsequent tables.

Figure 4-1 Proposed Annual Budgets by Scenario (thousands of dollars)

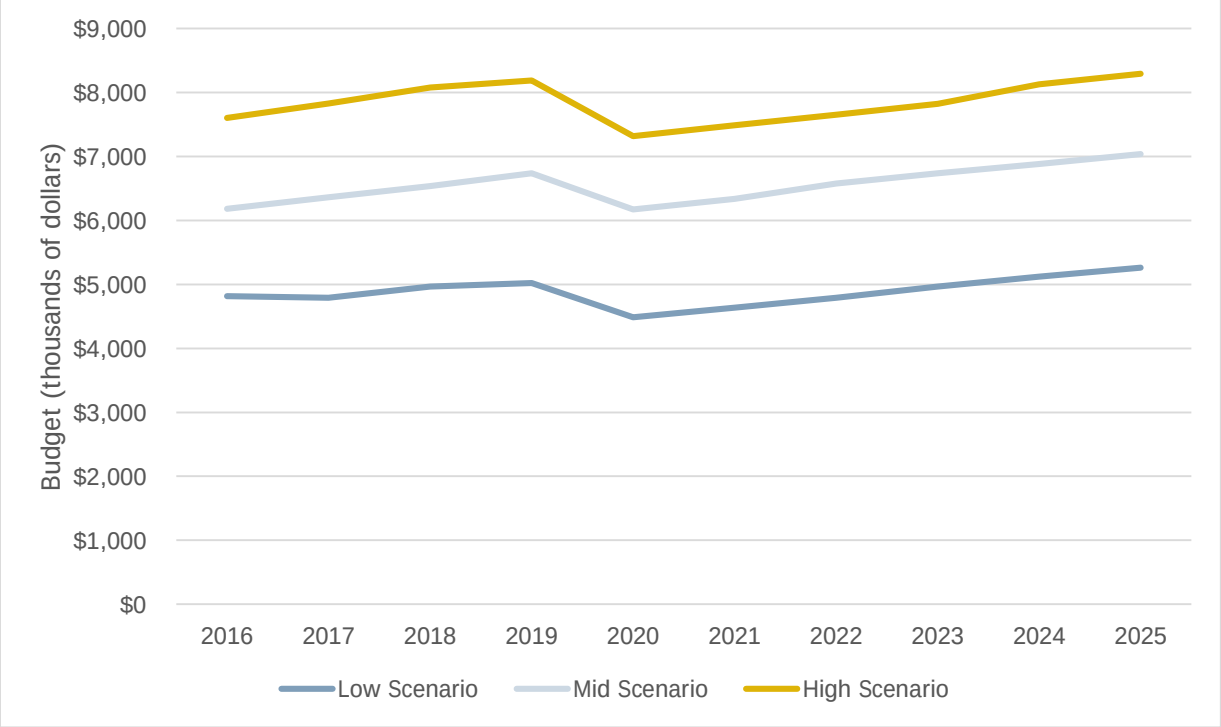
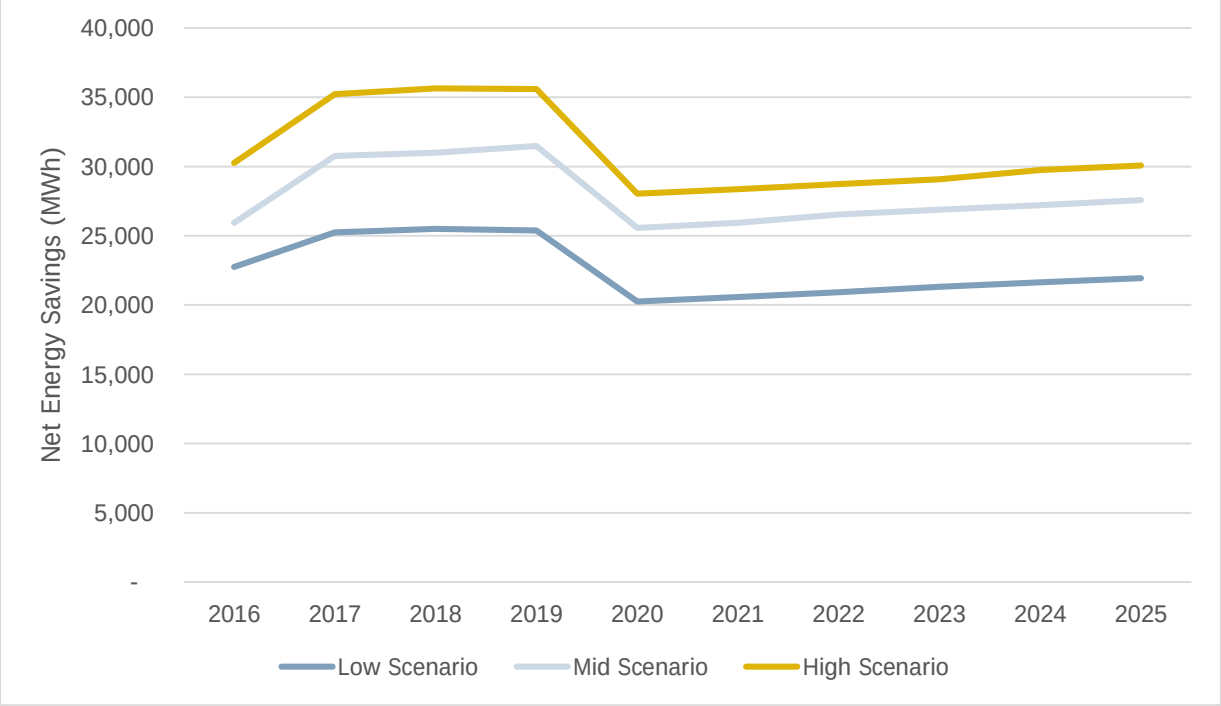


Figure 4-2 Proposed Energy Savings by Scenario (MWh)



Program Summary Tables – Low Scenario

The Low Scenario reflects low program participation given high barriers to customer acceptance, non-ideal implementation conditions, limited program budgets and limited access to implementation support.

Table 4-2 Proposed DSM Portfolio, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Budget	$4,816,920	$4,790,317	$4,964,241	$5,020,114	$4,481,509	$4,635,302	$4,786,974	$4,965,291	$5,116,154	$5,259,830
Total MWh Savings	22,757	25,248	25,496	25,369	20,258	20,573	20,918	21,305	21,629	21,942
Total Net Summer Peak kW Savings	3,245	4,235	4,286	4,278	3,789	3,839	3,892	3,969	4,020	4,069
Total Net Winter Peak kW Savings	3,447	4,465	4,535	4,542	4,066	4,122	4,186	4,246	4,305	4,364
Cost-Effectiveness										
TRC Test	1.41	1.56	1.60	1.63	1.63	1.67	1.71	1.72	1.72	1.74
RIM Test	0.43	0.44	0.44	0.44	0.42	0.43	0.43	0.42	0.42	0.41
Utility Cost Test	1.66	1.85	1.89	1.92	1.80	1.84	1.88	1.90	1.91	1.92
Participant Cost Test	9.33	9.84	10.13	10.53	12.83	13.07	13.31	13.38	13.60	13.86

Table 4-3 Proposed DSM Budget Categories, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$1,226,695	$1,284,722	$1,346,428	$1,352,378	$1,145,355	$1,212,904	$1,277,392	$1,356,704	$1,421,219	$1,481,949
Delivery	$2,271,009	$2,342,673	$2,408,758	$2,427,533	$2,165,677	$2,225,122	$2,284,326	$2,353,611	$2,412,575	$2,468,920
Measure Costs	$455,696	$473,954	$492,641	$510,866	$464,391	$469,624	$475,184	$480,569	$485,559	$491,301
Marketing	$213,086	$228,101	$244,264	$251,577	$255,773	$267,566	$279,814	$293,708	$305,968	$317,536
IT Reporting	$255,000	$63,750	$63,750	$63,750	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000
Vendor Incentives	$23,200	$26,150	$29,150	$32,100	$34,050	$36,500	$39,450	$41,400	$44,350	$46,800
Evaluation	$222,234	$220,968	$229,250	$231,910	$206,262	$213,586	$220,808	$229,300	$236,484	$243,325
General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Total Portfolio	**$4,816,920**	**$4,790,317**	**$4,964,241**	**$5,020,114**	**$4,481,509**	**$4,635,302**	**$4,786,974**	**$4,965,291**	**$5,116,154**	**$5,259,830**

Table 4-4 Proposed DSM Program Budgets, Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,012,571	$988,198	$963,589	$926,931	$267,140	$287,780	$297,553	$309,090	$318,863	$328,636
Residential	Appliance Recycling	$71,505	$70,040	$73,301	$76,561	$76,561	$76,561	$76,561	$76,561	$76,561	$76,561
Residential	New Manufactured Homes	$143,640	$139,766	$147,704	$147,704	$171,518	$180,338	$189,158	$197,978	$206,798	$215,618
Residential	Whole House Efficiency	$1,250,513	$1,270,850	$1,378,098	$1,467,369	$1,519,300	$1,574,541	$1,633,429	$1,685,950	$1,744,732	$1,800,690
Residential	Residential Home Performance	$631,050	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325
Residential	Targeted Energy Efficiency	$308,504	$308,504	$308,504	$308,504	$306,992	$306,992	$306,992	$306,992	$306,992	$306,992
Commercial	Commercial Incentive Program	$814,231	$776,104	$806,942	$806,942	$804,646	$824,488	$849,431	$905,620	$929,860	$949,736
Commercial	Express Install	$360,493	$397,930	$447,179	$447,179	$496,428	$545,677	$594,926	$644,175	$693,424	$742,673
Commercial	New Construction	$74,413	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601
n/a	General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
	Total Portfolio	**$4,816,920**	**$4,790,317**	**$4,964,241**	**$5,020,114**	**$4,481,509**	**$4,635,302**	**$4,786,974**	**$4,965,291**	**$5,116,154**	**$5,259,830**

Table 4-5 Proposed DSM Program Net Energy Savings (MWh), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	6,462	6,337	6,125	5,826	558	594	611	632	650	667
Residential	Appliance Recycling	223	235	246	257	257	257	257	257	257	257
Residential	New Manufactured Homes	214	227	240	240	280	294	309	323	337	351
Residential	Whole House Efficiency	2,150	2,341	2,536	2,696	2,621	2,708	2,818	2,914	3,010	3,113
Residential	Residential Home Performance	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Targeted Energy Efficiency	379	379	379	379	374	374	374	374	374	374
Commercial	Commercial Incentive Program	2,886	3,042	3,194	3,194	3,303	3,392	3,506	3,673	3,781	3,870
Commercial	Express Install	622	711	800	800	889	977	1,066	1,155	1,244	1,333
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
	Total Portfolio	**22,757**	**25,248**	**25,496**	**25,369**	**20,258**	**20,573**	**20,918**	**21,305**	**21,629**	**21,942**
	Portfolio as % Kentucky Power Sales	**0.34%**	**0.38%**	**0.39%**	**0.38%**	**0.31%**	**0.31%**	**0.31%**	**0.32%**	**0.32%**	**0.33%**

Table 4-6 Proposed DSM Program Net Summer Peak Savings (kW), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	662	650	629	598	63	67	68	71	73	74
Residential	Appliance Recycling	27	29	30	31	31	31	31	31	31	31
Residential	New Manufactured Homes	89	95	101	101	118	121	125	128	131	135
Residential	Whole House Efficiency	295	318	344	364	364	375	389	400	413	425
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	58	58	58	58	57	57	57	57	57	57
Commercial	Commercial Incentive Program	537	564	590	590	607	624	644	690	709	727
Commercial	Express Install	98	112	126	126	140	154	168	182	196	210
Commercial	New Construction	57	57	57	57	57	57	57	57	57	57
	Total Portfolio	**3,245**	**4,235**	**4,286**	**4,278**	**3,789**	**3,839**	**3,892**	**3,969**	**4,020**	**4,069**

Table 4-7 Proposed DSM Program Net Winter Peak Savings (kW), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	662	650	629	598	63	67	68	71	73	74
Residential	Appliance Recycling	27	29	30	31	31	31	31	31	31	31
Residential	New Manufactured Homes	60	64	67	67	79	82	85	89	92	95
Residential	Whole House Efficiency	535	588	634	670	689	706	731	751	771	794
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	117	117	117	117	116	116	116	116	116	116
Commercial	Commercial Incentive Program	491	518	544	544	561	578	598	618	638	655
Commercial	Express Install	98	112	126	126	140	154	168	182	196	210
Commercial	New Construction	36	36	36	36	36	36	36	36	36	36
	Total Portfolio	**3,447**	**4,465**	**4,535**	**4,542**	**4,066**	**4,122**	**4,186**	**4,246**	**4,305**	**4,364**

Table 4-8 Proposed DSM Program Gross Energy Savings (MWh), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	8,179	8,021	7,753	7,374	707	752	774	801	822	844
Residential	Appliance Recycling	319	335	351	367	367	367	367	367	367	367
Residential	New Manufactured Homes	329	350	370	370	432	454	476	498	520	541
Residential	Whole House Efficiency	2,390	2,622	2,862	3,063	3,009	3,130	3,277	3,405	3,537	3,676
Residential	Residential Home Performance	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Residential	Targeted Energy Efficiency	450	450	450	450	444	444	444	444	444	444
Commercial	Commercial Incentive Program	3,458	3,645	3,827	3,827	3,957	4,064	4,201	4,400	4,530	4,637
Commercial	Express Install	745	852	958	958	1,065	1,171	1,278	1,384	1,490	1,597
Commercial	New Construction	260	260	260	260	260	260	260	260	260	260
	Total Portfolio	**25,931**	**28,535**	**28,831**	**28,669**	**22,240**	**22,641**	**23,076**	**23,558**	**23,970**	**24,366**

Table 4-9 Proposed DSM Program Gross Summer Peak Savings (kW), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	839	823	796	758	80	84	87	90	92	94
Residential	Appliance Recycling	39	41	43	45	45	45	45	45	45	45
Residential	New Manufactured Homes	138	146	155	155	182	187	192	197	202	208
Residential	Whole House Efficiency	341	370	402	428	431	446	466	481	499	516
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	69	69	69	69	68	68	68	68	68	68
Commercial	Commercial Incentive Program	643	676	707	707	727	748	772	827	850	871
Commercial	Express Install	117	134	151	151	168	184	201	218	235	252
Commercial	New Construction	68	68	68	68	68	68	68	68	68	68
	Total Portfolio	**3,704**	**4,727**	**4,791**	**4,781**	**4,168**	**4,231**	**4,299**	**4,394**	**4,459**	**4,521**

Table 4-10 Proposed DSM Program Gross Winter Peak Savings (kW), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	839	823	796	758	80	84	87	90	92	94
Residential	Appliance Recycling	39	41	43	45	45	45	45	45	45	45
Residential	New Manufactured Homes	92	98	104	104	121	126	132	137	142	147
Residential	Whole House Efficiency	589	650	704	746	768	790	821	845	871	898
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	139	139	139	139	138	138	138	138	138	138
Commercial	Commercial Incentive Program	588	620	652	652	672	692	716	741	764	785
Commercial	Express Install	117	134	151	151	168	184	201	218	235	252
Commercial	New Construction	43	43	43	43	43	43	43	43	43	43
	Total Portfolio	**3,896**	**4,948**	**5,031**	**5,037**	**4,434**	**4,504**	**4,582**	**4,656**	**4,729**	**4,802**

Table 4-11 Proposed DSM Program Avoided TRC Benefits (NPV), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$2,299,070	$2,175,206	$2,044,320	$1,890,496	$342,436	$351,262	$347,520	$343,138	$337,773	$332,895
Residential	Appliance Recycling	$85,844	$85,694	$84,966	$83,789	$79,202	$74,754	$70,389	$65,237	$60,425	$55,947
Residential	New Manufactured Homes	$215,268	$217,719	$218,452	$205,608	$226,094	$221,887	$217,206	$211,059	$201,528	$191,797
Residential	Whole House Efficiency	$1,675,556	$1,724,836	$1,783,595	$1,790,586	$1,714,104	$1,685,760	$1,659,953	$1,608,134	$1,553,049	$1,500,877
Residential	Residential Home Performance	$1,087,329	$1,345,817	$1,282,127	$1,198,172	$1,132,204	$1,110,676	$1,081,509	$1,008,376	$940,722	$876,931
Residential	Targeted Energy Efficiency	$325,225	$306,951	$288,926	$271,392	$252,956	$237,866	$223,492	$208,010	$191,596	$176,279
Commercial	Commercial Incentive Program	$1,784,906	$1,778,878	$1,758,381	$1,651,557	$1,608,674	$1,551,141	$1,501,496	$1,470,099	$1,405,014	$1,336,551
Commercial	Express Install	$386,322	$416,736	$440,996	$413,449	$430,641	$444,028	$453,747	$456,396	$456,579	$454,616
Commercial	New Construction	$150,018	$142,429	$134,584	$126,424	$118,704	$111,417	$104,493	$97,211	$90,456	$84,175
	General Marketing & Education	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Portfolio	**$8,009,540**	**$8,194,266**	**$8,036,348**	**$7,631,474**	**$5,905,014**	**$5,788,790**	**$5,659,805**	**$5,467,660**	**$5,237,141**	**$5,010,067**

Table 4-12 Proposed DSM Program Avoided TRC Costs (NPV), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,419,872	$1,289,428	$1,166,516	$1,041,682	$159,711	$155,211	$146,702	$139,935	$132,122	$124,695
Residential	Appliance Recycling	$85,105	$78,017	$75,557	$73,030	$67,570	$62,518	$57,845	$53,520	$49,519	$45,817
Residential	New Manufactured Homes	$143,215	$128,992	$126,207	$116,772	$125,657	$121,204	$116,715	$112,220	$107,744	$103,311
Residential	Whole House Efficiency	$1,278,920	$1,206,896	$1,212,867	$1,194,753	$1,147,670	$1,101,851	$1,059,083	$1,012,507	$971,210	$928,489
Residential	Residential Home Performance	$631,050	$579,501	$536,178	$496,094	$459,006	$424,691	$392,941	$363,565	$336,385	$311,237
Residential	Targeted Energy Efficiency	$308,504	$285,441	$264,101	$244,357	$224,981	$208,162	$192,600	$178,201	$164,879	$152,553
Commercial	Commercial Incentive Program	$1,144,576	$1,039,965	$1,004,117	$929,050	$866,772	$822,369	$784,304	$775,318	$736,869	$696,760
Commercial	Express Install	$385,469	$394,591	$410,306	$379,632	$389,958	$396,619	$400,104	$400,851	$399,251	$395,649
Commercial	New Construction	$121,263	$101,268	$93,697	$86,692	$80,211	$74,215	$68,667	$63,533	$58,783	$54,389
	General Marketing & Education	$150,000	$138,786	$128,411	$118,811	$109,928	$101,710	$94,106	$87,071	$80,562	$74,539
	Total Portfolio	**$5,667,974**	**$5,242,884**	**$5,017,958**	**$4,680,873**	**$3,631,465**	**$3,468,551**	**$3,313,066**	**$3,186,721**	**$3,037,325**	**$2,887,439**

Table 4-13 Proposed DSM Program Levelized Cost ($/kWh), Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.030	$0.030	$0.030	$0.030	$0.050	$0.051	$0.051	$0.051	$0.052	$0.052
Residential	Appliance Recycling	$0.049	$0.046	$0.046	$0.046	$0.046	$0.046	$0.046	$0.046	$0.046	$0.046
Residential	New Manufactured Homes	$0.056	$0.052	$0.051	$0.051	$0.051	$0.051	$0.051	$0.051	$0.052	$0.053
Residential	Whole House Efficiency	$0.047	$0.043	$0.043	$0.043	$0.043	$0.043	$0.042	$0.042	$0.041	$0.041
Residential	Residential Home Performance	$0.032	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026
Residential	Targeted Energy Efficiency	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.061
Commercial	Commercial Incentive Program	$0.031	$0.028	$0.028	$0.028	$0.027	$0.027	$0.026	$0.027	$0.027	$0.027
Commercial	Express Install	$0.060	$0.058	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057
Commercial	New Construction	$0.035	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030
	Total Portfolio	**$0.039**	**$0.036**	**$0.036**	**$0.036**	**$0.039**	**$0.039**	**$0.039**	**$0.039**	**$0.039**	**$0.039**

Table 4-14 Proposed DSM Program First Year $/kWh, Low Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.148	$0.137	$0.128	$0.120	$0.334	$0.313	$0.291	$0.271	$0.251	$0.233
Residential	Appliance Recycling	$0.303	$0.261	$0.242	$0.223	$0.207	$0.191	$0.177	$0.164	$0.151	$0.140
Residential	New Manufactured Homes	$0.636	$0.539	$0.498	$0.461	$0.425	$0.393	$0.364	$0.337	$0.312	$0.289
Residential	Whole House Efficiency	$0.399	$0.346	$0.314	$0.289	$0.276	$0.253	$0.232	$0.212	$0.195	$0.178
Residential	Residential Home Performance	$0.062	$0.047	$0.043	$0.040	$0.037	$0.034	$0.032	$0.029	$0.027	$0.025
Residential	Targeted Energy Efficiency	$0.536	$0.496	$0.459	$0.424	$0.395	$0.365	$0.338	$0.313	$0.289	$0.268
Commercial	Commercial Incentive Program	$0.267	$0.223	$0.205	$0.189	$0.169	$0.156	$0.144	$0.135	$0.125	$0.115
Commercial	Express Install	$0.549	$0.490	$0.453	$0.419	$0.388	$0.358	$0.331	$0.306	$0.283	$0.262
Commercial	New Construction	$0.325	$0.253	$0.234	$0.216	$0.200	$0.185	$0.171	$0.159	$0.147	$0.136
	Total Portfolio	**$0.192**	**$0.160**	**$0.151**	**$0.141**	**$0.144**	**$0.135**	**$0.127**	**$0.119**	**$0.111**	**$0.104**

Table 4-15 Proposed DSM Program Net MWh Savings by End-Use and Sector, Low Scenario

Sector	End Use	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Appliance	73	77	81	86	86	90	90	94	94	94
Residential	Appliance Recycle	223	235	246	257	257	257	257	257	257	257
Residential	Behavioral	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Hot Water	281	297	313	329	360	366	372	379	385	391
Residential	HVAC	218	267	319	366	410	453	501	540	587	630
Residential	Lighting	6,665	6,554	6,355	6,070	473	504	521	538	556	573
Residential	Shell	1,868	1,984	2,100	2,180	2,376	2,414	2,470	2,521	2,563	2,618
Residential	Whole House	100	105	111	111	128	142	157	171	185	199
Commercial	Compressed Air	5	5	7	7	7	7	7	7	7	7
Commercial	Custom Project	822	905	987	987	1,069	1,110	1,151	1,192	1,234	1,275
Commercial	Express Install	622	711	800	800	889	977	1,066	1,155	1,244	1,333
Commercial	Food Service	142	142	142	142	142	142	142	169	169	169
Commercial	HVAC	269	281	281	281	293	293	305	339	351	351
Commercial	Lighting	1,601	1,657	1,723	1,723	1,738	1,786	1,841	1,906	1,961	2,009
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
Commercial	Refrigeration	47	53	54	54	54	55	60	60	60	60
	Total Portfolio	**22,757**	**25,248**	**25,496**	**25,369**	**20,258**	**20,573**	**20,918**	**21,305**	**21,629**	**21,942**

Program Summary Tables – Mid Scenario

The Mid Scenario reflects expected program participation given barriers to customer acceptance and non-ideal implementation conditions. These measures are delivered under less than ideal market conditions, however, there are less barriers and less limitations on budgets than there would be under the low scenario. This scenario is recommended for Kentucky Power to implement beginning 2016 and continuing through 2018 or until next portfolio evaluation of programs.

Table 4-16 Proposed DSM Portfolio, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Budget	$6,183,131	$6,360,962	$6,535,543	$6,736,329	$6,170,725	$6,338,562	$6,578,199	$6,735,911	$6,880,883	$7,037,488
Total MWh Savings	25,932	30,760	30,997	31,475	25,567	25,938	26,544	26,890	27,205	27,569
Total Net Summer Peak kW Savings	3,777	5,034	5,086	5,192	4,632	4,691	4,781	4,838	4,889	4,948
Total Net Winter Peak kW Savings	3,951	5,239	5,310	5,389	4,858	4,926	4,985	5,050	5,109	5,171
Portfolio Cost-Effectiveness										
TRC Test	1.24	1.49	1.53	1.56	1.63	1.67	1.70	1.71	1.72	1.72
RIM Test	0.39	0.42	0.42	0.42	0.43	0.43	0.43	0.43	0.42	0.41
Utility Cost Test	1.44	1.70	1.74	1.78	1.75	1.79	1.82	1.83	1.84	1.84
Participant Cost Test	9.34	10.47	10.75	10.94	13.24	13.49	13.79	14.04	14.30	14.54

Table 4-17 Proposed DSM Budget Categories, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$1,506,361	$1,749,620	$1,811,239	$1,889,695	$1,644,514	$1,718,968	$1,819,121	$1,886,959	$1,949,988	$2,018,104
Delivery	$3,079,898	$3,156,133	$3,222,067	$3,299,161	$3,034,035	$3,097,959	$3,201,901	$3,263,086	$3,319,430	$3,379,755
Measure Costs	$537,358	$561,023	$579,728	$597,950	$562,230	$567,690	$572,988	$578,438	$583,383	$589,005
Marketing	$293,621	$309,077	$325,536	$341,438	$350,595	$363,651	$380,034	$392,814	$404,614	$417,249
IT Reporting	$300,000	$108,750	$108,750	$108,750	$105,000	$105,000	$105,000	$105,000	$105,000	$105,000
Vendor Incentives	$28,600	$30,600	$34,150	$35,700	$37,650	$40,600	$43,050	$46,000	$47,950	$50,400
Evaluation	$287,292	$295,760	$304,074	$313,635	$286,701	$294,693	$306,105	$313,615	$320,518	$327,976
General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Total Portfolio	**$6,183,131**	**$6,360,962**	**$6,535,543**	**$6,736,329**	**$6,170,725**	**$6,338,562**	**$6,578,199**	**$6,735,911**	**$6,880,883**	**$7,037,488**

Table 4-18 Proposed DSM Program Budgets, Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,180,305	$1,155,932	$1,131,323	$1,093,397	$313,118	$333,758	$343,531	$355,068	$364,841	$374,614
Residential	Appliance Recycling	$100,032	$98,567	$101,828	$105,088	$105,088	$105,088	$105,088	$105,088	$105,088	$105,088
Residential	New Manufactured Homes	$178,920	$175,046	$182,984	$182,984	$202,388	$215,618	$228,848	$242,078	$255,308	$268,538
Residential	Whole House Efficiency	$1,483,792	$1,514,128	$1,627,405	$1,702,343	$1,812,938	$1,872,436	$1,928,540	$1,987,372	$2,040,217	$2,096,179
Residential	Residential Home Performance	$631,050	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325
Residential	Targeted Energy Efficiency	$367,721	$367,721	$367,721	$367,721	$365,957	$365,957	$365,957	$365,957	$365,957	$365,957
Commercial	Commercial Incentive Program	$857,131	$818,664	$844,130	$961,794	$949,736	$974,957	$1,000,539	$1,025,403	$1,045,279	$1,073,669
Commercial	Express Install	$409,742	$447,179	$496,428	$496,428	$594,926	$644,175	$693,424	$742,673	$791,922	$841,171
Commercial	New Construction	$74,413	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601
Commercial	School Energy Manager	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750
Commercial	Bid For Efficiency	$303,730	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506
Commercial	Retro-commissioning	$220,545	$220,545	$220,545	$263,393	$263,393	$263,393	$349,091	$349,091	$349,091	$349,091
n/a	General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
	Total Portfolio	**$6,183,131**	**$6,360,962**	**$6,535,543**	**$6,736,329**	**$6,170,725**	**$6,338,562**	**$6,578,199**	**$6,735,911**	**$6,880,883**	**$7,037,488**

Table 4-19 Proposed DSM Program Net Energy Savings (MWh), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	7,484	7,359	7,147	6,846	640	676	693	714	731	749
Residential	Appliance Recycling	322	334	345	356	356	356	356	356	356	356
Residential	New Manufactured Homes	272	285	298	298	332	353	375	397	419	441
Residential	Whole House Efficiency	2,596	2,810	3,013	3,167	3,179	3,288	3,379	3,482	3,580	3,670
Residential	Residential Home Performance	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Targeted Energy Efficiency	444	444	444	444	437	437	437	437	437	437
Commercial	Commercial Incentive Program	3,029	3,181	3,313	3,788	3,870	3,986	4,096	4,206	4,295	4,441
Commercial	Express Install	711	800	889	889	1,066	1,155	1,244	1,333	1,422	1,511
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
Commercial	School Energy Manager	558	558	558	558	558	558	558	558	558	558
Commercial	Bid For Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Retro-commissioning	694	694	694	833	833	833	1,110	1,110	1,110	1,110
	Total Portfolio	**25,932**	**30,760**	**30,997**	**31,475**	**25,567**	**25,938**	**26,544**	**26,890**	**27,205**	**27,569**
	Portfolio as a % Kentucky Power Sales	**0.39%**	**0.47%**	**0.47%**	**0.48%**	**0.39%**	**0.39%**	**0.40%**	**0.40%**	**0.41%**	**0.41%**

Table 4-20 Proposed DSM Program Net Summer Peak Savings (kW), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	769	756	735	704	73	77	79	81	83	85
Residential	Appliance Recycling	39	41	42	43	43	43	43	43	43	43
Residential	New Manufactured Homes	108	114	120	120	138	146	153	161	169	177
Residential	Whole House Efficiency	351	377	405	423	435	449	461	474	485	497
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	69	69	69	69	68	68	68	68	68	68
Commercial	Commercial Incentive Program	563	589	614	713	727	747	766	786	803	826
Commercial	Express Install	112	126	140	140	168	182	196	210	224	238
Commercial	New Construction	57	57	57	57	57	57	57	57	57	57
Commercial	School Energy Manager	201	201	201	201	201	201	201	201	201	201
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	87	87	87	104	104	104	139	139	139	139
	Total Portfolio	**3,777**	**5,034**	**5,086**	**5,192**	**4,632**	**4,691**	**4,781**	**4,838**	**4,889**	**4,948**

Table 4-21 Proposed DSM Program Net Winter Peak Savings (kW), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	769	756	735	704	73	77	79	81	83	85
Residential	Appliance Recycling	39	41	42	43	43	43	43	43	43	43
Residential	New Manufactured Homes	75	79	82	82	93	98	104	110	116	122
Residential	Whole House Efficiency	645	704	753	786	836	860	879	901	922	940
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	137	137	137	137	136	136	136	136	136	136
Commercial	Commercial Incentive Program	517	543	567	641	655	675	694	714	731	753
Commercial	Express Install	112	126	140	140	168	182	196	210	224	238
Commercial	New Construction	36	36	36	36	36	36	36	36	36	36
Commercial	School Energy Manager	201	201	201	201	201	201	201	201	201	201
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	87	87	87	104	104	104	139	139	139	139
	Total Portfolio	**3,951**	**5,239**	**5,310**	**5,389**	**4,858**	**4,926**	**4,985**	**5,050**	**5,109**	**5,171**

Table 4-22 Proposed DSM Program Gross Energy Savings (MWh), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	9,474	9,316	9,047	8,666	810	855	877	904	926	948
Residential	Appliance Recycling	461	477	493	509	509	509	509	509	509	509
Residential	New Manufactured Homes	419	439	460	460	511	544	578	612	645	679
Residential	Whole House Efficiency	2,900	3,152	3,403	3,592	3,630	3,777	3,902	4,042	4,172	4,296
Residential	Residential Home Performance	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Residential	Targeted Energy Efficiency	527	527	527	527	519	519	519	519	519	519
Commercial	Commercial Incentive Program	3,629	3,811	3,969	4,538	4,637	4,776	4,907	5,039	5,146	5,321
Commercial	Express Install	852	958	1,065	1,065	1,278	1,384	1,490	1,597	1,703	1,810
Commercial	New Construction	260	260	260	260	260	260	260	260	260	260
Commercial	School Energy Manager	558	558	558	558	558	558	558	558	558	558
Commercial	Bid For Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Retro-commissioning	832	832	832	998	998	998	1,330	1,330	1,330	1,330
	Total Portfolio	**29,710**	**34,647**	**34,931**	**35,490**	**28,028**	**28,499**	**29,249**	**29,689**	**30,087**	**30,548**

Table 4-23 Proposed DSM Program Gross Summer Peak Savings (kW), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	973	957	930	892	93	98	100	103	105	107
Residential	Appliance Recycling	56	58	60	62	62	62	62	62	62	62
Residential	New Manufactured Homes	167	175	184	184	212	224	236	248	260	272
Residential	Whole House Efficiency	407	438	473	496	512	530	548	566	580	596
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	82	82	82	82	81	81	81	81	81	81
Commercial	Commercial Incentive Program	674	706	735	854	871	895	918	941	962	989
Commercial	Express Install	134	151	168	168	201	218	235	252	268	285
Commercial	New Construction	68	68	68	68	68	68	68	68	68	68
Commercial	School Energy Manager	201	201	201	201	201	201	201	201	201	201
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	104	104	104	125	125	125	167	167	167	167
	Total Portfolio	**4,317**	**5,606**	**5,671**	**5,797**	**5,091**	**5,167**	**5,280**	**5,354**	**5,420**	**5,494**

Table 4-24 Proposed DSM Program Gross Winter Peak Savings (kW), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	973	957	930	892	93	98	100	103	105	107
Residential	Appliance Recycling	56	58	60	62	62	62	62	62	62	62
Residential	New Manufactured Homes	115	121	127	127	143	152	161	170	178	187
Residential	Whole House Efficiency	711	777	834	873	927	958	981	1,010	1,034	1,057
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	162	163	163	163	162	162	162	162	162	162
Commercial	Commercial Incentive Program	619	650	680	769	785	809	832	855	876	902
Commercial	Express Install	134	151	168	168	201	218	235	252	268	285
Commercial	New Construction	43	43	43	43	43	43	43	43	43	43
Commercial	School Energy Manager	201	201	201	201	201	201	201	201	201	201
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	104	104	104	125	125	125	167	167	167	167
	Total Portfolio	**4,570**	**5,890**	**5,975**	**6,086**	**5,407**	**5,491**	**5,607**	**5,688**	**5,761**	**5,838**

Table 4-25 Proposed DSM Program Avoided TRC Benefits (NPV), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$2,670,373	$2,530,010	$2,385,357	$2,216,508	$391,516	$398,104	$392,239	$385,573	$378,108	$371,295
Residential	Appliance Recycling	$123,875	$121,853	$119,190	$116,072	$109,718	$103,557	$97,511	$90,374	$83,707	$77,504
Residential	New Manufactured Homes	$269,322	$269,000	$266,918	$251,179	$266,282	$266,264	$265,114	$261,646	$253,447	$244,444
Residential	Whole House Efficiency	$2,042,287	$2,088,688	$2,130,580	$2,093,313	$2,046,136	$2,007,866	$1,954,651	$1,884,246	$1,810,697	$1,735,274
Residential	Residential Home Performance	$1,087,329	$1,345,817	$1,282,127	$1,198,172	$1,132,204	$1,110,676	$1,081,509	$1,008,376	$940,722	$876,931
Residential	Targeted Energy Efficiency	$389,738	$367,942	$346,409	$325,443	$303,471	$285,418	$268,211	$249,619	$229,959	$211,605
Commercial	Commercial Incentive Program	$1,865,643	$1,853,659	$1,821,420	$1,962,906	$1,890,935	$1,825,536	$1,778,147	$1,695,315	$1,608,754	$1,541,009
Commercial	Express Install	$441,511	$468,828	$489,995	$459,388	$516,769	$524,760	$529,372	$526,611	$521,805	$515,232
Commercial	New Construction	$150,018	$142,429	$134,584	$126,424	$118,704	$111,417	$104,493	$97,211	$90,456	$84,175
Commercial	School Energy Manager	$318,749	$306,849	$293,306	$277,418	$262,364	$247,551	$233,015	$217,041	$201,912	$187,254
Commercial	Bid For Efficiency	$0	$994,791	$938,368	$882,501	$831,023	$781,278	$733,100	$679,265	$629,224	$581,355
Commercial	Retro-commissioning	$178,908	$169,335	$161,753	$184,407	$175,692	$167,195	$211,559	$196,672	$182,627	$169,353
	Total Portfolio	**$9,537,754**	**$10,659,201**	**$10,370,008**	**$10,093,731**	**$8,044,815**	**$7,829,622**	**$7,648,920**	**$7,291,949**	**$6,931,417**	**$6,595,429**

Table 4-26 Proposed DSM Program Avoided TRC Costs (NPV), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,653,025	$1,505,151	$1,366,111	$1,225,164	$187,501	$180,923	$170,492	$161,946	$152,488	$143,539
Residential	Appliance Recycling	$119,582	$109,916	$105,072	$100,338	$92,837	$85,896	$79,475	$73,533	$68,036	$62,950
Residential	New Manufactured Homes	$175,272	$158,652	$153,650	$142,163	$147,544	$144,911	$141,847	$138,432	$134,734	$130,816
Residential	Whole House Efficiency	$1,517,845	$1,436,801	$1,431,138	$1,384,634	$1,365,540	$1,306,293	$1,246,652	$1,189,569	$1,130,728	$1,075,919
Residential	Residential Home Performance	$631,050	$579,501	$536,178	$496,094	$459,006	$424,691	$392,941	$363,565	$336,385	$311,237
Residential	Targeted Energy Efficiency	$367,721	$340,230	$314,795	$291,261	$268,193	$248,143	$229,592	$212,428	$196,547	$181,853
Commercial	Commercial Incentive Program	$1,202,900	$1,093,463	$1,046,757	$1,112,740	$1,027,566	$976,314	$927,667	$879,940	$830,344	$789,195
Commercial	Express Install	$438,286	$443,459	$455,521	$421,467	$467,373	$468,246	$466,376	$462,169	$455,984	$448,141
Commercial	New Construction	$121,263	$101,268	$93,697	$86,692	$80,211	$74,215	$68,667	$63,533	$58,783	$54,389
Commercial	School Energy Manager	$315,750	$292,145	$270,304	$250,096	$231,399	$214,100	$198,094	$183,285	$169,582	$156,904
Commercial	Bid For Efficiency	$303,730	$360,538	$333,585	$308,646	$285,572	$264,223	$244,470	$226,193	$209,283	$193,637
Commercial	Retro-commissioning	$158,128	$146,306	$135,369	$149,300	$138,139	$127,811	$156,358	$144,668	$133,853	$123,846
	General Marketing & Education	$150,000	$138,786	$128,411	$118,811	$109,928	$101,710	$94,106	$87,071	$80,562	$74,539
	Total Portfolio	**$7,154,551**	**$6,706,217**	**$6,370,588**	**$6,087,406**	**$4,860,809**	**$4,617,477**	**$4,416,737**	**$4,186,333**	**$3,957,310**	**$3,746,967**

Table 4-27 Proposed DSM Program Levelized Cost ($/kWh), Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.030	$0.030	$0.030	$0.030	$0.051	$0.052	$0.052	$0.052	$0.052	$0.052
Residential	Appliance Recycling	$0.047	$0.045	$0.045	$0.045	$0.045	$0.045	$0.045	$0.045	$0.045	$0.045
Residential	New Manufactured Homes	$0.055	$0.051	$0.051	$0.051	$0.051	$0.051	$0.051	$0.051	$0.052	$0.052
Residential	Whole House Efficiency	$0.045	$0.043	$0.042	$0.042	$0.043	$0.043	$0.042	$0.042	$0.042	$0.042
Residential	Residential Home Performance	$0.032	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026
Residential	Targeted Energy Efficiency	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.060	$0.060
Commercial	Commercial Incentive Program	$0.031	$0.028	$0.028	$0.028	$0.027	$0.027	$0.027	$0.027	$0.027	$0.026
Commercial	Express Install	$0.059	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057
Commercial	New Construction	$0.035	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030
Commercial	School Energy Manager	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053
Commercial	Bid For Efficiency	$0.000	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028
Commercial	Retro-commissioning	$0.070	$0.070	$0.070	$0.070	$0.070	$0.070	$0.069	$0.069	$0.069	$0.069
	Total Portfolio	**$0.042**	**$0.037**	**$0.037**	**$0.037**	**$0.039**	**$0.039**	**$0.039**	**$0.039**	**$0.039**	**$0.039**

Table 4-28 Proposed DSM Program First Year $/kWh, Mid Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.149	$0.138	$0.128	$0.120	$0.339	$0.317	$0.294	$0.273	$0.254	$0.235
Residential	Appliance Recycling	$0.294	$0.259	$0.239	$0.221	$0.205	$0.189	$0.175	$0.162	$0.150	$0.139
Residential	New Manufactured Homes	$0.623	$0.538	$0.497	$0.460	$0.423	$0.392	$0.362	$0.335	$0.310	$0.287
Residential	Whole House Efficiency	$0.388	$0.340	$0.311	$0.290	$0.279	$0.256	$0.235	$0.216	$0.197	$0.181
Residential	Residential Home Performance	$0.062	$0.047	$0.043	$0.040	$0.037	$0.034	$0.032	$0.029	$0.027	$0.025
Residential	Targeted Energy Efficiency	$0.524	$0.484	$0.448	$0.415	$0.386	$0.357	$0.330	$0.306	$0.283	$0.262
Commercial	Commercial Incentive Program	$0.268	$0.225	$0.206	$0.190	$0.170	$0.157	$0.145	$0.134	$0.124	$0.114
Commercial	Express Install	$0.546	$0.490	$0.453	$0.419	$0.387	$0.358	$0.331	$0.306	$0.283	$0.262
Commercial	New Construction	$0.325	$0.253	$0.234	$0.216	$0.200	$0.185	$0.171	$0.159	$0.147	$0.136
Commercial	School Energy Manager	$0.383	$0.354	$0.328	$0.303	$0.281	$0.260	$0.240	$0.222	$0.206	$0.190
Commercial	Bid For Efficiency	$0.000	$0.188	$0.174	$0.161	$0.149	$0.138	$0.128	$0.118	$0.109	$0.101
Commercial	Retro-commissioning	$0.301	$0.278	$0.257	$0.237	$0.219	$0.203	$0.187	$0.173	$0.160	$0.148
	Total Portfolio	**$0.210**	**$0.170**	**$0.160**	**$0.150**	**$0.153**	**$0.143**	**$0.133**	**$0.124**	**$0.116**	**$0.108**

Table 4-29 Proposed DSM Program Net MWh Savings by End-Use and Sector, Mid Scenario

Sector	End Use	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Appliance	106	111	115	117	117	121	121	125	125	125
Residential	Appliance Recycle	322	334	345	356	356	356	356	356	356	356
Residential	Behavioral	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Hot Water	328	350	365	381	439	445	451	457	463	470
Residential	HVAC	282	323	380	421	466	515	560	609	650	694
Residential	Lighting	7,700	7,593	7,394	7,109	523	555	572	589	606	623
Residential	Shell	2,238	2,374	2,494	2,574	2,886	2,947	2,995	3,051	3,109	3,156
Residential	Whole House	142	148	154	154	157	171	185	199	214	228
Commercial	Bid for Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Compressed Air	7	7	7	7	7	7	7	8	8	8
Commercial	Custom Project	822	905	987	1,192	1,275	1,316	1,357	1,398	1,439	1,480
Commercial	Express Install	711	800	889	889	1,066	1,155	1,244	1,333	1,422	1,511
Commercial	Food Service	142	142	142	169	169	169	173	173	173	200
Commercial	HVAC	281	293	293	351	351	363	363	375	375	391
Commercial	Lighting	1,723	1,780	1,829	2,009	2,009	2,064	2,129	2,184	2,232	2,288
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
Commercial	Refrigeration	54	54	55	60	60	68	68	68	68	74
Commercial	Retro-commissioning	694	694	694	833	833	833	1,110	1,110	1,110	1,110
Commercial	School Energy Manager	558	558	558	558	558	558	558	558	558	558
	Total Portfolio	**25,932**	**30,760**	**30,997**	**31,475**	**25,567**	**25,938**	**26,544**	**26,890**	**27,205**	**27,569**

Program Summary Tables – High Scenario

The High Scenario reflects expected program participation given ideal market implementation and few barriers to customer adoption. Information channels are assumed to be established and efficient for marketing, educating consumers, and coordinating with dealers and delivery partners.

Table 4-30 Proposed DSM Portfolio, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Budget	$7,597,971	$7,826,366	$8,076,040	$8,182,151	$7,313,447	$7,481,672	$7,649,987	$7,820,163	$8,124,459	$8,286,343
Total MWh Savings	30,266	35,223	35,631	35,586	28,034	28,370	28,733	29,085	29,750	30,076
Total Net Summer Peak kW Savings	4,381	5,657	5,734	5,739	4,999	5,054	5,111	5,173	5,282	5,336
Total Net Winter Peak kW Savings	4,437	5,724	5,801	5,820	5,091	5,152	5,214	5,281	5,338	5,402
Portfolio Cost-Effectiveness										
TRC Test	1.36	1.58	1.62	1.65	1.65	1.68	1.72	1.73	1.74	1.75
RIM Test	0.42	0.45	0.45	0.45	0.43	0.43	0.44	0.43	0.42	0.42
Utility Cost Test	1.51	1.74	1.77	1.80	1.68	1.72	1.76	1.77	1.78	1.79
Participant Cost Test	9.42	10.40	10.70	11.04	13.39	13.65	13.89	14.15	14.30	14.57

Table 4-31 Proposed DSM Budget Categories, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$2,137,796	$2,412,768	$2,513,232	$2,540,932	$2,218,253	$2,298,351	$2,377,003	$2,455,087	$2,585,775	$2,658,867
Delivery	$3,618,578	$3,712,952	$3,805,925	$3,847,679	$3,416,694	$3,476,263	$3,536,588	$3,598,252	$3,726,797	$3,786,101
Measure Costs	$624,025	$642,260	$660,995	$679,200	$606,802	$612,425	$617,512	$622,900	$628,310	$633,747
Marketing	$378,957	$397,596	$419,108	$430,057	$429,582	$442,556	$456,342	$470,328	$493,541	$506,933
IT Reporting	$300,000	$108,750	$108,750	$108,750	$105,000	$105,000	$105,000	$105,000	$105,000	$105,000
Vendor Incentives	$33,950	$36,500	$40,600	$43,050	$46,000	$47,950	$50,400	$53,350	$55,300	$58,250
Evaluation	$354,665	$365,541	$377,430	$382,483	$341,117	$349,127	$357,142	$365,246	$379,736	$387,445
General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Total Portfolio	**$7,597,971**	**$7,826,366**	**$8,076,040**	**$8,182,151**	**$7,313,447**	**$7,481,672**	**$7,649,987**	**$7,820,163**	**$8,124,459**	**$8,286,343**

Table 4-32 Proposed DSM Program Budgets, High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,430,714	$1,407,685	$1,384,419	$1,347,726	$375,808	$399,639	$410,590	$423,470	$434,421	$445,372
Residential	Appliance Recycling	$137,314	$136,332	$140,075	$143,819	$143,819	$143,819	$143,819	$143,819	$143,819	$143,819
Residential	New Manufactured Homes	$248,598	$251,603	$266,421	$266,421	$300,290	$316,166	$332,042	$347,918	$363,794	$379,670
Residential	Whole House Efficiency	$1,788,695	$1,813,184	$1,940,120	$2,029,932	$2,057,167	$2,114,053	$2,174,344	$2,238,792	$2,295,576	$2,359,052
Residential	Residential Home Performance	$631,050	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325	$626,325
Residential	Targeted Energy Efficiency	$426,536	$426,536	$426,536	$426,536	$424,520	$424,520	$424,520	$424,520	$424,520	$424,520
Commercial	Commercial Incentive Program	$1,162,256	$1,128,644	$1,163,989	$1,163,989	$1,158,866	$1,181,249	$1,213,197	$1,240,920	$1,412,356	$1,434,687
Commercial	Express Install	$458,991	$496,428	$545,677	$594,926	$644,175	$693,424	$742,673	$791,922	$841,171	$890,420
Commercial	New Construction	$74,413	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601	$62,601
Commercial	School Energy Manager	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750	$225,750
Commercial	Bid For Efficiency	$303,730	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506	$498,506
Commercial	Retro-commissioning	$520,798	$563,647	$606,496	$606,496	$606,496	$606,496	$606,496	$606,496	$606,496	$606,496
Industrial	Retro-commissioning	$39,126	$39,126	$39,126	$39,126	$39,126	$39,126	$39,126	$39,126	$39,126	$39,126
n/a	General Marketing/Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
	Total Portfolio	**$7,597,971**	**$7,826,366**	**$8,076,040**	**$8,182,151**	**$7,313,447**	**$7,481,672**	**$7,649,987**	**$7,820,163**	**$8,124,459**	**$8,286,343**

Table 4-33 Proposed DSM Program Net Energy Savings (MWh), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	8,929	8,804	8,592	8,291	697	736	753	774	792	809
Residential	Appliance Recycling	393	404	415	426	426	426	426	426	426	426
Residential	New Manufactured Homes	323	344	365	365	411	433	455	477	499	521
Residential	Whole House Efficiency	3,069	3,259	3,467	3,624	3,437	3,535	3,624	3,739	3,825	3,934
Residential	Residential Home Performance	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Targeted Energy Efficiency	508	508	508	508	501	501	501	501	501	501
Commercial	Commercial Incentive Program	3,878	4,037	4,189	4,189	4,288	4,378	4,523	4,629	5,079	5,169
Commercial	Express Install	800	889	977	1,066	1,155	1,244	1,333	1,422	1,511	1,599
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
Commercial	School Energy Manager	614	614	614	614	614	614	614	614	614	614
Commercial	Bid For Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Retro-commissioning	1,782	1,921	2,060	2,060	2,060	2,060	2,060	2,060	2,060	2,060
Industrial	Retro-commissioning	148	148	148	148	148	148	148	148	148	148
	Total Portfolio	**30,266**	**35,223**	**35,631**	**35,586**	**28,034**	**28,370**	**28,733**	**29,085**	**29,750**	**30,076**
	Portfolio as % Kentucky Power Sales	**0.46%**	**0.53%**	**0.54%**	**0.54%**	**0.42%**	**0.43%**	**0.43%**	**0.44%**	**0.44%**	**0.45%**

Table 4-34 Proposed DSM Program Net Summer Peak Savings (kW), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	918	905	884	853	81	85	87	90	91	93
Residential	Appliance Recycling	48	49	51	52	52	52	52	52	52	52
Residential	New Manufactured Homes	128	138	148	148	164	172	180	188	195	203
Residential	Whole House Efficiency	412	435	464	484	472	483	495	513	525	538
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	77	77	77	77	76	76	76	76	76	76
Commercial	Commercial Incentive Program	731	758	784	784	799	817	839	858	932	949
Commercial	Express Install	126	140	154	168	182	196	210	224	238	252
Commercial	New Construction	57	57	57	57	57	57	57	57	57	57
Commercial	School Energy Manager	221	221	221	221	221	221	221	221	221	221
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	223	241	258	258	258	258	258	258	258	258
Industrial	Retro-commissioning	19	19	19	19	19	19	19	19	19	19
	Total Portfolio	**4,381**	**5,657**	**5,734**	**5,739**	**4,999**	**5,054**	**5,111**	**5,173**	**5,282**	**5,336**

Table 4-35 Proposed DSM Program Net Winter Peak Savings (kW), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	918	905	884	853	81	85	87	90	91	93
Residential	Appliance Recycling	48	49	51	52	52	52	52	52	52	52
Residential	New Manufactured Homes	89	95	101	101	113	119	125	131	137	142
Residential	Whole House Efficiency	763	817	868	902	905	925	943	969	986	1,011
Residential	Residential Home Performance	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Residential	Targeted Energy Efficiency	157	157	157	157	156	156	156	156	156	156
Commercial	Commercial Incentive Program	659	686	713	713	727	745	766	785	804	822
Commercial	Express Install	126	140	154	168	182	196	210	224	238	252
Commercial	New Construction	36	36	36	36	36	36	36	36	36	36
Commercial	School Energy Manager	221	221	221	221	221	221	221	221	221	221
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	223	241	258	258	258	258	258	258	258	258
Industrial	Retro-commissioning	19	19	19	19	19	19	19	19	19	19
	Total Portfolio	**4,437**	**5,724**	**5,801**	**5,820**	**5,091**	**5,152**	**5,214**	**5,281**	**5,338**	**5,402**

Table 4-36 Proposed DSM Program Gross Energy Savings (MWh), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	11,302	11,144	10,876	10,495	883	931	953	980	1,002	1,024
Residential	Appliance Recycling	561	577	593	609	609	609	609	609	609	609
Residential	New Manufactured Homes	498	530	562	562	634	667	701	735	768	802
Residential	Whole House Efficiency	3,435	3,664	3,926	4,120	3,955	4,083	4,206	4,359	4,477	4,622
Residential	Residential Home Performance	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Residential	Targeted Energy Efficiency	604	604	604	604	595	595	595	595	595	595
Commercial	Commercial Incentive Program	4,647	4,837	5,019	5,019	5,138	5,245	5,419	5,546	6,085	6,193
Commercial	Express Install	958	1,065	1,171	1,278	1,384	1,490	1,597	1,703	1,810	1,916
Commercial	New Construction	260	260	260	260	260	260	260	260	260	260
Commercial	School Energy Manager	614	614	614	614	614	614	614	614	614	614
Commercial	Bid For Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Retro-commissioning	2,136	2,302	2,468	2,468	2,468	2,468	2,468	2,468	2,468	2,468
Industrial	Retro-commissioning	177	177	177	177	177	177	177	177	177	177
	Total Portfolio	**34,991**	**40,092**	**40,587**	**40,523**	**31,035**	**31,459**	**31,918**	**32,365**	**33,183**	**33,599**

Table 4-37 Proposed DSM Program Gross Summer Peak Savings (kW), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	1,162	1,146	1,119	1,080	103	108	110	113	116	118
Residential	Appliance Recycling	69	71	72	74	74	74	74	74	74	74
Residential	New Manufactured Homes	197	213	228	228	253	265	277	289	301	313
Residential	Whole House Efficiency	478	506	544	569	561	576	592	616	632	650
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	92	92	92	92	91	91	91	91	91	91
Commercial	Commercial Incentive Program	876	908	940	940	957	978	1,006	1,028	1,117	1,137
Commercial	Express Install	151	168	184	201	218	235	252	268	285	302
Commercial	New Construction	68	68	68	68	68	68	68	68	68	68
Commercial	School Energy Manager	221	221	221	221	221	221	221	221	221	221
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	268	289	309	309	309	309	309	309	309	309
Industrial	Retro-commissioning	22	22	22	22	22	22	22	22	22	22
	Total Portfolio	**5,053**	**6,368**	**6,466**	**6,471**	**5,544**	**5,614**	**5,688**	**5,766**	**5,902**	**5,971**

Table 4-38 Proposed DSM Program Gross Winter Peak Savings (kW), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	1,162	1,146	1,119	1,080	103	108	110	113	116	118
Residential	Appliance Recycling	69	71	72	74	74	74	74	74	74	74
Residential	New Manufactured Homes	137	146	156	156	175	184	192	201	210	219
Residential	Whole House Efficiency	841	903	964	1,004	1,012	1,036	1,059	1,091	1,111	1,142
Residential	Residential Home Performance	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Residential	Targeted Energy Efficiency	186	187	187	187	185	185	185	185	185	185
Commercial	Commercial Incentive Program	790	822	854	854	871	892	918	941	964	984
Commercial	Express Install	151	168	184	201	218	235	252	268	285	302
Commercial	New Construction	43	43	43	43	43	43	43	43	43	43
Commercial	School Energy Manager	221	221	221	221	221	221	221	221	221	221
Commercial	Bid For Efficiency	-	265	265	265	265	265	265	265	265	265
Commercial	Retro-commissioning	268	289	309	309	309	309	309	309	309	309
Industrial	Retro-commissioning	22	22	22	22	22	22	22	22	22	22
	Total Portfolio	**5,339**	**6,682**	**6,797**	**6,817**	**5,899**	**5,975**	**6,052**	**6,135**	**6,206**	**6,285**

Table 4-39 Proposed DSM Program Avoided TRC Benefits (NPV), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$3,170,399	$3,008,203	$2,845,785	$2,658,811	$422,780	$429,291	$421,882	$413,547	$404,545	$396,317
Residential	Appliance Recycling	$150,859	$147,508	$143,471	$138,977	$131,369	$123,992	$116,752	$108,207	$100,226	$92,798
Residential	New Manufactured Homes	$319,736	$325,170	$327,953	$308,632	$325,778	$322,232	$317,727	$310,809	$298,642	$285,918
Residential	Whole House Efficiency	$2,439,603	$2,451,931	$2,477,482	$2,441,992	$2,279,196	$2,218,721	$2,151,999	$2,078,946	$1,989,129	$1,905,987
Residential	Residential Home Performance	$1,087,329	$1,345,817	$1,282,127	$1,198,172	$1,132,204	$1,110,676	$1,081,509	$1,008,376	$940,722	$876,931
Residential	Targeted Energy Efficiency	$452,004	$426,715	$401,732	$377,437	$352,033	$331,119	$311,178	$289,573	$266,773	$245,485
Commercial	Commercial Incentive Program	$2,395,071	$2,357,752	$2,331,625	$2,190,041	$2,111,353	$2,023,042	$1,954,517	$1,857,003	$1,910,975	$1,807,247
Commercial	Express Install	$496,700	$520,920	$538,995	$551,265	$559,833	$565,126	$567,184	$561,718	$554,418	$545,539
Commercial	New Construction	$150,018	$142,429	$134,584	$126,424	$118,704	$111,417	$104,493	$97,211	$90,456	$84,175
Commercial	School Energy Manager	$350,624	$337,534	$322,637	$305,160	$288,601	$272,306	$256,316	$238,745	$222,103	$205,980
Commercial	Bid For Efficiency	$0	$994,791	$938,368	$882,501	$831,023	$781,278	$733,100	$679,265	$629,224	$581,355
Commercial	Retro-commissioning	$459,500	$468,779	$480,142	$456,155	$434,598	$413,579	$392,489	$364,871	$338,814	$314,188
Industrial	Retro-commissioning	$38,119	$36,079	$34,464	$32,742	$31,195	$29,686	$28,172	$26,190	$24,319	$22,552
	Total Portfolio	**$11,509,961**	**$12,563,628**	**$12,259,365**	**$11,668,308**	**$9,018,665**	**$8,732,465**	**$8,437,319**	**$8,034,461**	**$7,770,345**	**$7,364,471**

Table 4-40 Proposed DSM Program Avoided TRC Costs (NPV), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$1,959,476	$1,788,779	$1,628,615	$1,468,109	$207,964	$200,784	$188,916	$179,048	$168,353	$158,257
Residential	Appliance Recycling	$147,114	$135,466	$128,783	$122,342	$113,196	$104,733	$96,904	$89,659	$82,956	$76,754
Residential	New Manufactured Homes	$210,945	$196,716	$193,548	$179,079	$185,530	$180,326	$174,863	$169,209	$163,423	$157,557
Residential	Whole House Efficiency	$1,786,568	$1,676,531	$1,661,178	$1,607,667	$1,508,020	$1,433,595	$1,364,893	$1,300,226	$1,233,800	$1,173,481
Residential	Residential Home Performance	$631,050	$579,501	$536,178	$496,094	$459,006	$424,691	$392,941	$363,565	$336,385	$311,237
Residential	Targeted Energy Efficiency	$426,536	$394,648	$365,145	$337,847	$311,112	$287,853	$266,334	$246,423	$228,000	$210,955
Commercial	Commercial Incentive Program	$1,517,837	$1,386,346	$1,325,628	$1,226,525	$1,135,826	$1,071,551	$1,018,127	$963,823	$999,287	$939,688
Commercial	Express Install	$491,103	$492,328	$500,736	$505,137	$506,080	$504,059	$499,512	$492,828	$484,351	$474,388
Commercial	New Construction	$121,263	$101,268	$93,697	$86,692	$80,211	$74,215	$68,667	$63,533	$58,783	$54,389
Commercial	School Energy Manager	$324,750	$300,472	$278,009	$257,225	$237,995	$220,203	$203,740	$188,509	$174,416	$161,377
Commercial	Bid For Efficiency	$303,730	$360,538	$333,585	$308,646	$285,572	$264,223	$244,470	$226,193	$209,283	$193,637
Commercial	Retro-commissioning	$374,805	$374,880	$372,850	$344,976	$319,185	$295,323	$273,245	$252,817	$233,917	$216,429
Industrial	Retro-commissioning	$29,728	$27,506	$25,450	$23,547	$21,787	$20,158	$18,651	$17,257	$15,966	$14,773
	General Marketing & Education	$150,000	$138,786	$128,411	$118,811	$109,928	$101,710	$94,106	$87,071	$80,562	$74,539
	Total Portfolio	**$8,474,905**	**$7,953,766**	**$7,571,811**	**$7,082,695**	**$5,481,412**	**$5,183,424**	**$4,905,370**	**$4,640,162**	**$4,469,484**	**$4,217,461**

Table 4-41 Proposed DSM Program Levelized Cost ($/kWh), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.031	$0.031	$0.031	$0.031	$0.057	$0.057	$0.058	$0.058	$0.058	$0.058
Residential	Appliance Recycling	$0.053	$0.052	$0.052	$0.052	$0.052	$0.052	$0.052	$0.052	$0.052	$0.052
Residential	New Manufactured Homes	$0.064	$0.061	$0.061	$0.061	$0.061	$0.061	$0.061	$0.061	$0.062	$0.063
Residential	Whole House Efficiency	$0.046	$0.044	$0.043	$0.043	$0.044	$0.044	$0.043	$0.043	$0.043	$0.043
Residential	Residential Home Performance	$0.032	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026	$0.026
Residential	Targeted Energy Efficiency	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.059	$0.060	$0.060
Commercial	Commercial Incentive Program	$0.033	$0.031	$0.030	$0.030	$0.029	$0.029	$0.029	$0.029	$0.030	$0.030
Commercial	Express Install	$0.059	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057	$0.057
Commercial	New Construction	$0.035	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030	$0.030
Commercial	School Energy Manager	$0.048	$0.048	$0.048	$0.048	$0.048	$0.048	$0.048	$0.048	$0.048	$0.048
Commercial	Bid For Efficiency	$0.000	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028	$0.028
Commercial	Retro-commissioning	$0.064	$0.064	$0.065	$0.065	$0.065	$0.065	$0.065	$0.065	$0.065	$0.065
Industrial	Retro-commissioning	$0.058	$0.058	$0.058	$0.058	$0.058	$0.058	$0.058	$0.058	$0.058	$0.058
	Total Portfolio	**$0.043**	**$0.038**	**$0.038**	**$0.039**	**$0.041**	**$0.041**	**$0.041**	**$0.041**	**$0.041**	**$0.041**

Table 4-42 Proposed DSM Program Levelized Cost ($/kWh), High Scenario

Sector	Program Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Residential Efficient Products	$0.152	$0.140	$0.131	$0.122	$0.376	$0.351	$0.326	$0.303	$0.281	$0.261
Residential	Appliance Recycling	$0.331	$0.296	$0.273	$0.253	$0.234	$0.217	$0.200	$0.185	$0.172	$0.159
Residential	New Manufactured Homes	$0.728	$0.641	$0.592	$0.548	$0.506	$0.468	$0.433	$0.401	$0.371	$0.343
Residential	Whole House Efficiency	$0.389	$0.345	$0.318	$0.293	$0.281	$0.257	$0.237	$0.218	$0.200	$0.184
Residential	Residential Home Performance	$0.062	$0.047	$0.043	$0.040	$0.037	$0.034	$0.032	$0.029	$0.027	$0.025
Residential	Targeted Energy Efficiency	$0.514	$0.476	$0.440	$0.408	$0.379	$0.351	$0.324	$0.300	$0.278	$0.257
Commercial	Commercial Incentive Program	$0.284	$0.245	$0.225	$0.208	$0.187	$0.173	$0.159	$0.147	$0.141	$0.131
Commercial	Express Install	$0.543	$0.489	$0.452	$0.418	$0.387	$0.358	$0.331	$0.306	$0.283	$0.262
Commercial	New Construction	$0.325	$0.253	$0.234	$0.216	$0.200	$0.185	$0.171	$0.159	$0.147	$0.136
Commercial	School Energy Manager	$0.348	$0.322	$0.298	$0.276	$0.255	$0.236	$0.218	$0.202	$0.187	$0.173
Commercial	Bid For Efficiency	$0.000	$0.188	$0.174	$0.161	$0.149	$0.138	$0.128	$0.118	$0.109	$0.101
Commercial	Retro-commissioning	$0.255	$0.239	$0.223	$0.206	$0.191	$0.176	$0.163	$0.151	$0.140	$0.129
Industrial	Retro-commissioning	$0.019	$0.017	$0.014	$0.013	$0.012	$0.011	$0.011	$0.010	$0.009	$0.008
	Total Portfolio	**$0.213**	**$0.176**	**$0.165**	**$0.155**	**$0.158**	**$0.147**	**$0.138**	**$0.128**	**$0.121**	**$0.113**

Table 4-43 Proposed DSM Program Net MWh Savings by End-Use and Sector, High Scenario

Sector	End Use	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	Appliance	127	131	135	137	138	143	143	147	147	147
Residential	Appliance Recycle	393	404	415	426	426	426	426	426	426	426
Residential	Behavioral	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Residential	Hot Water	381	397	413	429	455	462	467	474	480	486
Residential	HVAC	344	392	457	501	551	592	637	686	726	775
Residential	Lighting	9,174	9,062	8,864	8,578	559	593	610	627	645	662
Residential	Shell	2,634	2,757	2,880	2,960	3,129	3,187	3,234	3,301	3,348	3,409
Residential	Whole House	171	177	182	182	214	228	242	256	271	285
Commercial	Bid for Efficiency	-	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
Commercial	Compressed Air	7	7	7	7	8	8	8	8	8	8
Commercial	Custom Project	1,234	1,316	1,398	1,398	1,480	1,521	1,563	1,604	1,645	1,686
Commercial	Express Install	800	889	977	1,066	1,155	1,244	1,333	1,422	1,511	1,599
Commercial	Food Service	169	169	173	173	173	173	200	200	200	200
Commercial	HVAC	351	363	363	363	375	375	391	392	745	745
Commercial	Lighting	2,058	2,115	2,181	2,181	2,184	2,232	2,288	2,352	2,408	2,455
Commercial	New Construction	217	217	217	217	217	217	217	217	217	217
Commercial	Refrigeration	60	68	68	68	68	68	74	74	74	75
Commercial	Retro-commissioning	1,782	1,921	2,060	2,060	2,060	2,060	2,060	2,060	2,060	2,060
Commercial	School Energy Manager	614	614	614	614	614	614	614	614	614	614
Industrial	Retro-commissioning	148	148	148	148	148	148	148	148	148	148
	Total Portfolio	**30,266**	**35,223**	**35,631**	**35,586**	**28,034**	**28,370**	**28,733**	**29,085**	**29,750**	**30,076**

Residential Efficient Products

The overall objective is to increase the penetration of efficient lighting and efficient appliances in customer homes.

Target Market

Residential customers as well as lighting manufacturers and local retailers.

Program Description

The program incentivizes the purchase and installation of efficient lighting and appliances.

- *Lighting Incentives*. Kentucky Power continues to utilize an upstream strategy to provide incentives at participating retailers. Customers receive an instant incentive on qualifying CFL and LED light bulbs at the point-of-purchase. Incentives may vary depending upon the type of light bulb, manufacturer and associated retail cost. Customers may purchase up to 12 bulbs at a time.
- *Appliance Incentives*. Customers submit a mail-in application to receive an incentive for the purchase of an ENERGY STAR® clothes washer, air purifier or dehumidifier.

Implementation Strategy

KPCO should engage a third-party implementation contractor to efficiently obtain the energy savings goals while adhering to the budget. Implementation contractor tasks include:

- Establish relationships with lighting manufacturers and retailers throughout KPCO's service territory.
- Provide in-store promotional materials and conduct in-store promotion events. Provide training to retail sales staff.
- Customer marketing and educational materials.
- Process mail-in rebate applications, verifying customer eligibility and issuing incentives.
- Track program performance, including review and validation of sales data for accuracy and payment to retailers.
- Periodically report progress towards program goals and opportunities for improvement.

Marketing efforts to increase customer awareness may include, but not be limited to bill inserts, newspaper advertisements, internet advertisements, and point-of-purchase materials (hang tags, posters, etc.).

Risk Management

Upstream programs simplify the participation process for residential customers, eliminating the need to complete and submit a rebate application. However, upstream programs typically have higher free ridership rates and leakage outside of the service territory. A number of steps may be taken to reduce free ridership and leakage while increasing spillover, including:

- KPCO has, and should continue, to work with the implementation contractor to select retailers located well within the service territory to reduce leakage outside of the service territory.
- The program should be cross-marketed with KPCO's other residential programs (e.g., bill inserts to promote multiple programs).
- Incentives should be modified as needed to respond to the market price of qualifying light bulbs, with a goal of the incentive being no higher than 50% of the incremental cost.

- KPCO should work with the implementation contractor and third party evaluator to understand any market transformation elements that arise from this upstream program.

The United States Congress passed the Energy Independence and Security Act of 2007 ("EISA") to promote energy efficiency through performance standards for electronic appliances and lighting. In particular, the legislation set efficiency standards for 'general service' light bulbs.

The efficiency standards are being implemented in two phases:

- *Phase 1.* Between 2012 and 2014, standard light bulbs will be required to use approximately 20 to 30 percent less energy than current incandescent light bulbs.
- *Phase 2*. Beginning in 2020, there must be a 60 percent reduction in light bulb energy use.

Phase 2 has a significant impact on the cost-effectiveness of the program in 2020.[8] Program opportunities should be reviewed periodically by the implementation contractor and Kentucky Power DSM staff to determine if additional measures are available and cost-effective.

Change from Current Program

The proposed program design removes ENERGY STAR® refrigerators and freezers as well as heat pump water heaters from the existing KPCO program. These measures are not cost-effective based upon updated appliance standards and KPCO avoided costs. The proposed program design incorporates ENERGY STAR® air purifiers.

Measures & Incentives[9]

Measures and incentives were set for planning purposes and may be modified to reflect market conditions.

Residential Efficient Products - Eligible Measures and Incentives[10]

	Unit	Average Incentive per Unit		
		Low	Mid	High
CFL	per Bulb	$1.00	$1.00	$1.00
LED	per Bulb	$3.00	$3.00	$3.50
Specialty LED	per Bulb	$5.00	$5.00	$6.00
ENERGY STAR® Clothes Washer	per Unit	$50	$50	$55
ENERGY STAR® Dehumidifier	per Unit	$25	$25	$30
ENERGY STAR® Air Purifier	per Unit	$25	$25	$30

Estimated Participation

The analysis assumed that, on average, a customer would purchase 8 CFL or LED light bulbs and 4 specialty LED light bulbs.

Residential Efficient Products - Estimated Participation, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	40,625	39,375	37,500	35,000	-	-	-	-	-	-
LED	3,125	3,375	3,625	3,875	4,375	4,875	5,125	5,375	5,625	5,875
Specialty LED	1,750	1,775	1,800	1,825	1,850	1,875	1,900	1,925	1,950	1,975
ENERGY STAR® Clothes Washer	600	610	620	630	630	640	640	650	650	650
ENERGY STAR® Dehumidifier	100	110	120	130	130	140	140	150	150	150
ENERGY STAR® Air Purifier	35	45	55	65	65	75	75	85	85	85

[8] Phase 2 assumes full implementation of EISA legislation.
[9] Only cost-effective measures were included for program implementation consideration.
[10] A range of incentive levels may be utilized in order to achieve participation goals.

Residential Efficient Products - Estimated Participation, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	46,875	45,625	43,750	41,250	-	-	-	-	-	-
LED	3,750	4,000	4,250	4,500	5,000	5,500	5,750	6,000	6,250	6,500
Specialty LED	1,875	1,900	1,925	1,950	1,975	2,000	2,025	2,050	2,075	2,100
ENERGY STAR® Clothes Washer	800	810	820	820	820	830	830	840	840	840
ENERGY STAR® Dehumidifier	200	210	220	220	220	230	230	240	240	240
ENERGY STAR® Air Purifier	50	60	70	80	80	90	90	100	100	100

Residential Efficient Products - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	56,250	55,000	53,125	50,625	-	-	-	-	-	-
LED	4,375	4,625	4,875	5,125	5,250	5,750	6,000	6,250	6,500	6,750
Specialty LED	2,000	2,025	2,050	2,075	2,150	2,200	2,225	2,250	2,275	2,300
ENERGY STAR® Clothes Washer	850	860	870	870	870	880	880	890	890	890
ENERGY STAR® Dehumidifier	300	310	320	320	330	340	340	350	350	350
ENERGY STAR® Air Purifier	65	75	85	95	95	105	105	115	115	115

Projected Net Energy & Demand Savings

Residential Efficient Products - Projected Net Savings per Measure

Measure	Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Standard CFL	per Bulb	17	0.002	0.002
LED	per Bulb	21	0.002	0.002
Specialty LED	per Bulb	31	0.003	0.003
ENERGY STAR® Clothes Washer	per Unit	88	0.011	0.011
ENERGY STAR® Dehumidifier	per Unit	127	0.029	0.029
ENERGY STAR® Air Purifier	per Unit	211	0.024	0.024

Residential Efficient Products - Incremental Net Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	5,654	5,480	5,219	4,871	-	-	-	-	-	-
LED	520	562	604	645	246	275	289	303	317	331
Specialty LED	214	217	220	223	227	230	233	236	239	242
ENERGY STAR® Clothes Washer	53	54	54	55	55	56	56	57	57	57
ENERGY STAR® Dehumidifier	13	14	15	17	17	18	18	19	19	19
ENERGY STAR® Air Purifier	7	9	12	14	14	16	16	18	18	18
Total	**6,462**	**6,337**	**6,125**	**5,826**	**558**	**594**	**611**	**632**	**650**	**667**

Residential Efficient Products - Incremental Net Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	6,524	6,350	6,089	5,741	-	-	-	-	-	-
LED	624	666	708	749	282	310	324	338	352	366
Specialty LED	230	233	236	239	242	245	248	251	254	257
ENERGY STAR® Clothes Washer	70	71	72	72	72	73	73	74	74	74
ENERGY STAR® Dehumidifier	25	27	28	28	28	29	29	31	31	31
ENERGY STAR® Air Purifier	11	13	15	17	17	19	19	21	21	21
Total	**7,484**	**7,359**	**7,147**	**6,846**	**640**	**676**	**693**	**714**	**731**	**749**

Residential Efficient Products - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	7,829	7,655	7,394	7,046	-	-	-	-	-	-
LED	728	770	812	853	296	324	338	352	366	380
Specialty LED	245	248	251	254	263	269	272	275	279	282
ENERGY STAR® Clothes Washer	75	76	76	76	76	77	77	78	78	78
ENERGY STAR® Dehumidifier	38	39	41	41	42	43	43	45	45	45
ENERGY STAR® Air Purifier	14	16	18	20	20	22	22	24	24	24
Total	**8,929**	**8,804**	**8,592**	**8,291**	**697**	**736**	**753**	**774**	**792**	**809**

Residential Efficient Products - Incremental Net Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	575.1	557.4	530.8	495.4	-	-	-	-	-	-
LED	52.9	57.2	61.4	65.6	25.1	27.9	29.4	30.8	32.2	33.7
Specialty LED	23.9	24.3	24.6	25.0	25.3	25.6	26.0	26.3	26.7	27.0
ENERGY STAR® Clothes Washer	6.8	6.9	7.0	7.1	7.1	7.2	7.2	7.4	7.4	7.4
ENERGY STAR® Dehumidifier	2.9	3.2	3.5	3.8	3.8	4.1	4.1	4.4	4.4	4.4
ENERGY STAR® Air Purifier	0.8	1.1	1.3	1.6	1.6	1.8	1.8	2.0	2.0	2.0
Total	**662.5**	**650.0**	**628.7**	**598.5**	**62.8**	**66.7**	**68.5**	**70.9**	**72.7**	**74.4**

Residential Efficient Products - Incremental Net Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	663.5	645.8	619.3	583.9	-	-	-	-	-	-
LED	63.5	67.7	72.0	76.2	28.6	31.5	32.9	34.4	35.8	37.2
Specialty LED	25.6	26.0	26.3	26.7	27.0	27.4	27.7	28.0	28.4	28.7
ENERGY STAR® Clothes Washer	9.0	9.2	9.3	9.3	9.3	9.4	9.4	9.5	9.5	9.5
ENERGY STAR® Dehumidifier	5.8	6.1	6.4	6.4	6.4	6.7	6.7	7.0	7.0	7.0
ENERGY STAR® Air Purifier	1.2	1.4	1.7	1.9	1.9	2.2	2.2	2.4	2.4	2.4
Total	**768.8**	**756.3**	**735.0**	**704.4**	**73.3**	**77.1**	**78.9**	**81.3**	**83.1**	**84.8**

Residential Efficient Products - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	796.2	778.5	752.0	716.6	-	-	-	-	-	-
LED	74.1	78.3	82.6	86.8	30.1	32.9	34.4	35.8	37.2	38.7
Specialty LED	27.4	27.7	28.0	28.4	29.4	30.1	30.4	30.8	31.1	31.5
ENERGY STAR® Clothes Washer	9.6	9.7	9.8	9.8	9.8	10.0	10.0	10.1	10.1	10.1
ENERGY STAR® Dehumidifier	8.7	9.0	9.3	9.3	9.6	9.9	9.9	10.2	10.2	10.2
ENERGY STAR® Air Purifier	1.6	1.8	2.0	2.3	2.3	2.5	2.5	2.8	2.8	2.8
Total	**917.6**	**905.1**	**883.8**	**853.2**	**81.2**	**85.4**	**87.2**	**89.6**	**91.4**	**93.1**

Residential Efficient Products - Incremental Net Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	575.1	557.4	530.8	495.4	-	-	-	-	-	-
LED	52.9	57.2	61.4	65.6	25.1	27.9	29.4	30.8	32.2	33.7
Specialty LED	23.9	24.3	24.6	25.0	25.3	25.6	26.0	26.3	26.7	27.0
ENERGY STAR® Clothes Washer	6.8	6.9	7.0	7.1	7.1	7.2	7.2	7.4	7.4	7.4
ENERGY STAR® Dehumidifier	2.9	3.2	3.5	3.8	3.8	4.1	4.1	4.4	4.4	4.4
ENERGY STAR® Air Purifier	0.8	1.1	1.3	1.6	1.6	1.8	1.8	2.0	2.0	2.0
Total	**662.5**	**650.0**	**628.7**	**598.5**	**62.8**	**66.7**	**68.5**	**70.9**	**72.7**	**74.4**

Residential Efficient Products - Incremental Net Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	663.5	645.8	619.3	583.9	-	-	-	-	-	-
LED	63.5	67.7	72.0	76.2	28.6	31.5	32.9	34.4	35.8	37.2
Specialty LED	25.6	26.0	26.3	26.7	27.0	27.4	27.7	28.0	28.4	28.7
ENERGY STAR® Clothes Washer	9.0	9.2	9.3	9.3	9.3	9.4	9.4	9.5	9.5	9.5
ENERGY STAR® Dehumidifier	5.8	6.1	6.4	6.4	6.4	6.7	6.7	7.0	7.0	7.0
ENERGY STAR® Air Purifier	1.2	1.4	1.7	1.9	1.9	2.2	2.2	2.4	2.4	2.4
Total	**768.8**	**756.3**	**735.0**	**704.4**	**73.3**	**77.1**	**78.9**	**81.3**	**83.1**	**84.8**

Residential Efficient Products - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	796.2	778.5	752.0	716.6	-	-	-	-	-	-
LED	74.1	78.3	82.6	86.8	30.1	32.9	34.4	35.8	37.2	38.7
Specialty LED	27.4	27.7	28.0	28.4	29.4	30.1	30.4	30.8	31.1	31.5
ENERGY STAR® Clothes Washer	9.6	9.7	9.8	9.8	9.8	10.0	10.0	10.1	10.1	10.1
ENERGY STAR® Dehumidifier	8.7	9.0	9.3	9.3	9.6	9.9	9.9	10.2	10.2	10.2
ENERGY STAR® Air Purifier	1.6	1.8	2.0	2.3	2.3	2.5	2.5	2.8	2.8	2.8
Total	**917.6**	**905.1**	**883.8**	**853.2**	**81.2**	**85.4**	**87.2**	**89.6**	**91.4**	**93.1**

Projected Gross Energy & Demand Savings

Residential Efficient Products - Projected Gross Savings per Measure

	Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Standard CFL	per Bulb	22	0.002	0.002
LED	per Bulb	26	0.003	0.003
Specialty LED	per Bulb	39	0.004	0.004
ENERGY STAR® Clothes Washer	per Unit	111	0.014	0.014
ENERGY STAR® Dehumidifier	per Unit	161	0.037	0.037
ENERGY STAR® Air Purifier	per Unit	267	0.030	0.030

Residential Efficient Products - Incremental Gross Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	7,157	6,937	6,607	6,166	-	-	-	-	-	-
LED	659	711	764	817	312	348	365	383	401	419
Specialty LED	271	275	279	283	287	291	294	298	302	306
ENERGY STAR® Clothes Washer	67	68	69	70	70	71	71	72	72	72
ENERGY STAR® Dehumidifier	16	18	19	21	21	23	23	24	24	24
ENERGY STAR® Air Purifier	9	12	15	17	17	20	20	23	23	23
Total	**8,179**	**8,021**	**7,753**	**7,374**	**707**	**752**	**774**	**801**	**822**	**844**

Residential Efficient Products - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	8,258	8,038	7,708	7,267	-	-	-	-	-	-
LED	790	843	896	948	356	392	410	428	446	463
Specialty LED	291	294	298	302	306	310	314	318	322	325
ENERGY STAR® Clothes Washer	89	90	91	91	91	92	92	93	93	93
ENERGY STAR® Dehumidifier	32	34	35	35	35	37	37	39	39	39
ENERGY STAR® Air Purifier	13	16	19	21	21	24	24	27	27	27
Total	**9,474**	**9,316**	**9,047**	**8,666**	**810**	**855**	**877**	**904**	**926**	**948**

Residential Efficient Products - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	9,910	9,690	9,360	8,919	-	-	-	-	-	-
LED	922	975	1,028	1,080	374	410	428	446	463	481
Specialty LED	310	314	318	322	333	341	345	349	353	356
ENERGY STAR® Clothes Washer	94	96	97	97	97	98	98	99	99	99
ENERGY STAR® Dehumidifier	48	50	52	52	53	55	55	56	56	56
ENERGY STAR® Air Purifier	17	20	23	25	25	28	28	31	31	31
Total	**11,302**	**11,144**	**10,876**	**10,495**	**883**	**931**	**953**	**980**	**1,002**	**1,024**

Residential Efficient Products - Incremental Gross Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	727.9	705.5	671.9	627.1	-	-	-	-	-	-
LED	67.0	72.3	77.7	83.1	31.7	35.3	37.2	39.0	40.8	42.6
Specialty LED	30.3	30.7	31.2	31.6	32.0	32.5	32.9	33.3	33.8	34.2
ENERGY STAR® Clothes Washer	8.6	8.7	8.9	9.0	9.0	9.2	9.2	9.3	9.3	9.3
ENERGY STAR® Dehumidifier	3.7	4.0	4.4	4.8	4.8	5.2	5.2	5.5	5.5	5.5
ENERGY STAR® Air Purifier	1.1	1.4	1.7	2.0	2.0	2.3	2.3	2.6	2.6	2.6
Total	**838.6**	**822.8**	**795.8**	**757.6**	**79.5**	**84.4**	**86.7**	**89.7**	**92.0**	**94.2**

Residential Efficient Products - Incremental Gross Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	839.9	817.5	783.9	739.1	-	-	-	-	-	-
LED	80.4	85.7	91.1	96.5	36.3	39.9	41.7	43.5	45.3	47.1
Specialty LED	32.5	32.9	33.3	33.8	34.2	34.6	35.1	35.5	35.9	36.4
ENERGY STAR® Clothes Washer	11.5	11.6	11.7	11.7	11.7	11.9	11.9	12.0	12.0	12.0
ENERGY STAR® Dehumidifier	7.4	7.7	8.1	8.1	8.1	8.5	8.5	8.8	8.8	8.8
ENERGY STAR® Air Purifier	1.5	1.8	2.1	2.4	2.4	2.7	2.7	3.0	3.0	3.0
Total	**973.1**	**957.3**	**930.3**	**891.6**	**92.7**	**97.6**	**99.8**	**102.9**	**105.2**	**107.4**

Residential Efficient Products - Incremental Gross Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	1,007.9	985.5	951.9	907.1	-	-	-	-	-	-
LED	93.8	99.1	104.5	109.9	38.1	41.7	43.5	45.3	47.1	48.9
Specialty LED	34.6	35.1	35.5	35.9	37.2	38.1	38.5	39.0	39.4	39.8
ENERGY STAR® Clothes Washer	12.2	12.3	12.5	12.5	12.5	12.6	12.6	12.7	12.7	12.7
ENERGY STAR® Dehumidifier	11.0	11.4	11.8	11.8	12.1	12.5	12.5	12.9	12.9	12.9
ENERGY STAR® Air Purifier	2.0	2.3	2.6	2.9	2.9	3.2	3.2	3.5	3.5	3.5
Total	**1,161.5**	**1,145.7**	**1,118.7**	**1,080.0**	**102.8**	**108.1**	**110.3**	**113.4**	**115.6**	**117.9**

Residential Efficient Products - Incremental Gross Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	727.9	705.5	671.9	627.1	-	-	-	-	-	-
LED	67.0	72.3	77.7	83.1	31.7	35.3	37.2	39.0	40.8	42.6
Specialty LED	30.3	30.7	31.2	31.6	32.0	32.5	32.9	33.3	33.8	34.2
ENERGY STAR® Clothes Washer	8.6	8.7	8.9	9.0	9.0	9.2	9.2	9.3	9.3	9.3
ENERGY STAR® Dehumidifier	3.7	4.0	4.4	4.8	4.8	5.2	5.2	5.5	5.5	5.5
ENERGY STAR® Air Purifier	1.1	1.4	1.7	2.0	2.0	2.3	2.3	2.6	2.6	2.6
Total	**838.6**	**822.8**	**795.8**	**757.6**	**79.5**	**84.4**	**86.7**	**89.7**	**92.0**	**94.2**

Residential Efficient Products - Incremental Gross Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	839.9	817.5	783.9	739.1	-	-	-	-	-	-
LED	80.4	85.7	91.1	96.5	36.3	39.9	41.7	43.5	45.3	47.1
Specialty LED	32.5	32.9	33.3	33.8	34.2	34.6	35.1	35.5	35.9	36.4
ENERGY STAR® Clothes Washer	11.5	11.6	11.7	11.7	11.7	11.9	11.9	12.0	12.0	12.0
ENERGY STAR® Dehumidifier	7.4	7.7	8.1	8.1	8.1	8.5	8.5	8.8	8.8	8.8
ENERGY STAR® Air Purifier	1.5	1.8	2.1	2.4	2.4	2.7	2.7	3.0	3.0	3.0
Total	**973.1**	**957.3**	**930.3**	**891.6**	**92.7**	**97.6**	**99.8**	**102.9**	**105.2**	**107.4**

Residential Efficient Products - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Standard CFL	1,007.9	985.5	951.9	907.1	-	-	-	-	-	-
LED	93.8	99.1	104.5	109.9	38.1	41.7	43.5	45.3	47.1	48.9
Specialty LED	34.6	35.1	35.5	35.9	37.2	38.1	38.5	39.0	39.4	39.8
ENERGY STAR® Clothes Washer	12.2	12.3	12.5	12.5	12.5	12.6	12.6	12.7	12.7	12.7
ENERGY STAR® Dehumidifier	11.0	11.4	11.8	11.8	12.1	12.5	12.5	12.9	12.9	12.9
ENERGY STAR® Air Purifier	2.0	2.3	2.6	2.9	2.9	3.2	3.2	3.5	3.5	3.5
Total	**1,161.5**	**1,145.7**	**1,118.7**	**1,080.0**	**102.8**	**108.1**	**110.3**	**113.4**	**115.6**	**117.9**

Estimated Annual Program Budget

Residential Efficient Products - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$468,375	$465,875	$458,375	$445,875	$178,375	$191,875	$198,375	$205,875	$212,375	$218,875
Delivery	$460,950	$451,675	$436,150	$414,375	$69,500	$75,225	$77,850	$81,075	$83,700	$86,325
Marketing	$20,029	$19,841	$19,429	$18,791	$6,544	$6,976	$7,159	$7,421	$7,604	$7,786
IT Reporting	$15,000	$3,750	$3,750	$3,750	$0	$0	$0	$0	$0	$0
Evaluation	$48,218	$47,057	$45,885	$44,140	$12,721	$13,704	$14,169	$14,719	$15,184	$15,649
Total	**$1,012,571**	**$988,198**	**$963,589**	**$926,931**	**$267,140**	**$287,780**	**$297,553**	**$309,090**	**$318,863**	**$328,636**

Residential Efficient Products - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$548,750	$546,250	$538,750	$525,500	$208,000	$221,500	$228,000	$235,500	$242,000	$248,500
Delivery	$536,625	$527,350	$511,825	$489,650	$82,275	$88,000	$90,625	$93,850	$96,475	$99,100
Marketing	$23,725	$23,538	$23,125	$22,430	$7,933	$8,365	$8,548	$8,810	$8,993	$9,175
IT Reporting	$15,000	$3,750	$3,750	$3,750	$0	$0	$0	$0	$0	$0
Evaluation	$56,205	$55,044	$53,873	$52,067	$14,910	$15,893	$16,359	$16,908	$17,373	$17,839
Total	**$1,180,305**	**$1,155,932**	**$1,131,323**	**$1,093,397**	**$313,118**	**$333,758**	**$343,531**	**$355,068**	**$364,841**	**$374,614**

Residential Efficient Products - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$678,200	$676,950	$670,700	$658,600	$259,200	$275,550	$283,150	$291,900	$299,500	$307,100
Delivery	$640,550	$631,275	$615,750	$593,575	$89,150	$95,000	$97,625	$100,850	$103,475	$106,100
Marketing	$28,835	$28,677	$28,294	$27,624	$9,562	$10,059	$10,263	$10,555	$10,760	$10,964
IT Reporting	$15,000	$3,750	$3,750	$3,750	$0	$0	$0	$0	$0	$0
Evaluation	$68,129	$67,033	$65,925	$64,177	$17,896	$19,030	$19,552	$20,165	$20,687	$21,208
Total	**$1,430,714**	**$1,407,685**	**$1,384,419**	**$1,347,726**	**$375,808**	**$399,639**	**$410,590**	**$423,470**	**$434,421**	**$445,372**

Cost-Effectiveness

Residential Efficient Products - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.62	1.69	1.75	1.81	2.14	2.26	2.37	2.45	2.56	2.67
RIM Test	0.47	0.48	0.48	0.49	0.46	0.46	0.47	0.48	0.48	0.49
Utility Cost Test	2.27	2.38	2.48	2.57	1.75	1.80	1.86	1.91	1.97	2.04
Participant Cost Test	5.84	5.97	6.10	6.23	8.40	8.89	9.25	9.57	9.94	10.33

Residential Efficient Products - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.62	1.68	1.75	1.81	2.09	2.20	2.30	2.38	2.48	2.59
RIM Test	0.47	0.47	0.48	0.49	0.45	0.46	0.47	0.47	0.48	0.49
Utility Cost Test	2.26	2.37	2.46	2.56	1.71	1.76	1.82	1.87	1.93	1.99
Participant Cost Test	5.82	5.96	6.09	6.22	8.28	8.72	9.06	9.36	9.71	10.07

Residential Efficient Products - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.62	1.68	1.75	1.81	2.03	2.14	2.23	2.31	2.40	2.50
RIM Test	0.47	0.47	0.48	0.49	0.44	0.45	0.45	0.46	0.46	0.47
Utility Cost Test	2.22	2.31	2.40	2.49	1.54	1.58	1.64	1.68	1.73	1.79
Participant Cost Test	5.87	6.00	6.14	6.28	8.31	8.72	9.04	9.34	9.67	10.02

Appliance Recycling

The overall objective is to promote the removal and retirement of inefficient appliances.

Target Market

All residential and small commercial customers.

Program Description

The program incentivizes residential customers to remove inefficient refrigerators and freezers from the electric system and dispose of them in an environmentally safe and responsible manner. The refrigerator/freezer must be in working conditioner and a minimum of 10 cubic feet in size.[11] The refrigerators and freezers are picked-up at no cost to the customer.

Implementation Strategy

KPCO should select an implementation contractor that demonstrates a record of providing the services offered and responsibly disposing appliances. Implementation contractor responsibilities include:

- Scheduling pickups from customer homes, verification of customer eligibility, verification of appliance qualification, appliance removal from customer homes as well as recycling / responsibility disposing of appliances.
- Rebate processing.
- Program tracking.
- Periodically reporting progress towards program goals and opportunities for improvement.
- Marketing plan and services to achieve program goals.

The implementation contractor will develop innovative and creative marketing strategies and materials. Marketing may include, but not be limited to, bill inserts, newspaper/community newsletter advertisements, community events, billboards, radio advertisements and Kentucky Power's DSM website. The program includes an educational component that informs customers about the benefits of recycling their inefficient appliances and environmentally responsible disposal of appliances.

Risk Management

Experience at other utilities suggests that program cost-effectiveness hinges on volume due to high unit disposal costs that can be reduced by ensuring higher volumes. The implementation contractor will need to use extensive and effective marketing to obtain the volumes.

Actual energy and demand savings could be lowered if a customer recycles a secondary appliance and begins utilizing their former primary unit as a secondary unit. The educational component attempts to influence consumer behavior by encouraging customers to avoid replacing recycled secondary refrigerators or freezers.

Appliance recycling programs typically have higher free ridership rates than other programs, primarily due to:

- Customers that were planning to replace their appliance prior to participating in the program.
- Customers that were not using their appliance prior to participating in the program.

In an effort to reduce free ridership, the implementation contractor should emphasize and enforce the requirement that the appliance is plugged in and in operating condition at the time of pick-up. In

[11] Only residential size appliances qualify.

an effort to increase spillover, the program should be cross-marketed with other residential programs.

Change from Current Program

The proposed program design decreases participation goals based upon the market research conducted.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions.

Appliance Recycling - Eligible Measures and Incentives

	Unit	Average Incentive per Unit		
		Low	Mid	High
Refrigerator Recycle	per Unit	$50	$50	$70
Freezer Recycle	per Unit	$50	$50	$70

Estimated Participation

Appliance Recycling - Estimated Participation, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	300	315	330	345	345	345	345	345	345	345
Freezer Recycle	100	105	110	115	115	115	115	115	115	115

Appliance Recycling - Estimated Participation, Mid Scenario[12]

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	450	465	480	495	495	495	495	495	495	495
Freezer Recycle	125	130	135	140	140	140	140	140	140	140

Appliance Recycling - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	550	565	580	595	595	595	595	595	595	595
Freezer Recycle	150	155	160	165	165	165	165	165	165	165

Projected Net Energy & Demand Savings

Appliance Recycling - Projected Net Savings per Measure

	Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Refrigerator Recycle	per Unit	574	0.071	0.071
Freezer Recycle	per Unit	512	0.060	0.060

Appliance Recycling - Incremental Net Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	172	181	190	198	198	198	198	198	198	198
Freezer Recycle	51	54	56	59	59	59	59	59	59	59
Total	**223**	**235**	**246**	**257**	**257**	**257**	**257**	**257**	**257**	**257**

Appliance Recycling - Incremental Net Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	258	267	276	284	284	284	284	284	284	284
Freezer Recycle	64	67	69	72	72	72	72	72	72	72
Total	**322**	**334**	**345**	**356**	**356**	**356**	**356**	**356**	**356**	**356**

[12] Program participation is based on market potential study results and KPCO market characteristics assuming a certain percentage of customers will retire their appliance per yet.

Appliance Recycling - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	316	325	333	342	342	342	342	342	342	342
Freezer Recycle	77	79	82	84	84	84	84	84	84	84
Total	**393**	**404**	**415**	**426**	**426**	**426**	**426**	**426**	**426**	**426**

Appliance Recycling - Incremental Net Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	21.3	22.3	23.4	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Freezer Recycle	6.0	6.3	6.6	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Total	**27**	**29**	**30**	**31**	**31**	**31**	**31**	**31**	**31**	**31**

Appliance Recycling - Incremental Net Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	31.9	33.0	34.0	35.1	35.1	35.1	35.1	35.1	35.1	35.1
Freezer Recycle	7.5	7.8	8.1	8.4	8.4	8.4	8.4	8.4	8.4	8.4
Total	**39**	**41**	**42**	**43**	**43**	**43**	**43**	**43**	**43**	**43**

Appliance Recycling - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	39.0	40.0	41.1	42.2	42.2	42.2	42.2	42.2	42.2	42.2
Freezer Recycle	9.0	9.3	9.6	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Total	**48**	**49**	**51**	**52**	**52**	**52**	**52**	**52**	**52**	**52**

Appliance Recycling - Incremental Net Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	21.3	22.3	23.4	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Freezer Recycle	6.0	6.3	6.6	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Total	**27**	**29**	**30**	**31**	**31**	**31**	**31**	**31**	**31**	**31**

Appliance Recycling - Incremental Net Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	31.9	33.0	34.0	35.1	35.1	35.1	35.1	35.1	35.1	35.1
Freezer Recycle	7.5	7.8	8.1	8.4	8.4	8.4	8.4	8.4	8.4	8.4
Total	**39**	**41**	**42**	**43**	**43**	**43**	**43**	**43**	**43**	**43**

Appliance Recycling - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	39.0	40.0	41.1	42.2	42.2	42.2	42.2	42.2	42.2	42.2
Freezer Recycle	9.0	9.3	9.6	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Total	**48**	**49**	**51**	**52**	**52**	**52**	**52**	**52**	**52**	**52**

Projected Gross Energy & Demand Savings

Appliance Recycling - Projected Gross Savings per Measure

	Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Refrigerator Recycle	per unit	821	0.101	0.101
Freezer Recycle	per unit	731	0.086	0.086

Appliance Recycling - Incremental Gross Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	246	258	271	283	283	283	283	283	283	283
Freezer Recycle	73	77	80	84	84	84	84	84	84	84
Total	**319**	**335**	**351**	**367**	**367**	**367**	**367**	**367**	**367**	**367**

Appliance Recycling - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	369	382	394	406	406	406	406	406	406	406
Freezer Recycle	91	95	99	102	102	102	102	102	102	102
Total	**461**	**477**	**493**	**509**	**509**	**509**	**509**	**509**	**509**	**509**

Appliance Recycling - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	451	464	476	488	488	488	488	488	488	488
Freezer Recycle	110	113	117	121	121	121	121	121	121	121
Total	**561**	**577**	**593**	**609**	**609**	**609**	**609**	**609**	**609**	**609**

Appliance Recycling - Incremental Gross Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	30.4	31.9	33.4	34.9	34.9	34.9	34.9	34.9	34.9	34.9
Freezer Recycle	8.6	9.0	9.4	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Total	**39**	**41**	**43**	**45**	**45**	**45**	**45**	**45**	**45**	**45**

Appliance Recycling - Incremental Gross Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	45.6	47.1	48.6	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Freezer Recycle	10.7	11.2	11.6	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Total	**56**	**58**	**60**	**62**	**62**	**62**	**62**	**62**	**62**	**62**

Appliance Recycling - Incremental Gross Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	55.7	57.2	58.7	60.3	60.3	60.3	60.3	60.3	60.3	60.3
Freezer Recycle	12.9	13.3	13.7	14.2	14.2	14.2	14.2	14.2	14.2	14.2
Total	**69**	**71**	**72**	**74**	**74**	**74**	**74**	**74**	**74**	**74**

Appliance Recycling - Incremental Gross Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	30.4	31.9	33.4	34.9	34.9	34.9	34.9	34.9	34.9	34.9
Freezer Recycle	8.6	9.0	9.4	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Total	**39**	**41**	**43**	**45**	**45**	**45**	**45**	**45**	**45**	**45**

Appliance Recycling - Incremental Gross Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	45.6	47.1	48.6	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Freezer Recycle	10.7	11.2	11.6	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Total	**56**	**58**	**60**	**62**	**62**	**62**	**62**	**62**	**62**	**62**

Appliance Recycling - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Refrigerator Recycle	55.7	57.2	58.7	60.3	60.3	60.3	60.3	60.3	60.3	60.3
Freezer Recycle	12.9	13.3	13.7	14.2	14.2	14.2	14.2	14.2	14.2	14.2
Total	**69**	**71**	**72**	**74**	**74**	**74**	**74**	**74**	**74**	**74**

Estimated Annual Program Budget

Appliance Recycling - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$20,000	$21,000	$22,000	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000
Delivery	$34,000	$35,700	$37,400	$39,100	$39,100	$39,100	$39,100	$39,100	$39,100	$39,100
Marketing	$8,100	$8,505	$8,910	$9,315	$9,315	$9,315	$9,315	$9,315	$9,315	$9,315
IT Reporting	$6,000	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Evaluation	$3,405	$3,335	$3,491	$3,646	$3,646	$3,646	$3,646	$3,646	$3,646	$3,646
Total	**$71,505**	**$70,040**	**$73,301**	**$76,561**	**$76,561**	**$76,561**	**$76,561**	**$76,561**	**$76,561**	**$76,561**

Appliance Recycling - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$28,750	$29,750	$30,750	$31,750	$31,750	$31,750	$31,750	$31,750	$31,750	$31,750
Delivery	$48,875	$50,575	$52,275	$53,975	$53,975	$53,975	$53,975	$53,975	$53,975	$53,975
Marketing	$11,644	$12,049	$12,454	$12,859	$12,859	$12,859	$12,859	$12,859	$12,859	$12,859
IT Reporting	$6,000	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Evaluation	$4,763	$4,694	$4,849	$5,004	$5,004	$5,004	$5,004	$5,004	$5,004	$5,004
Total	**$100,032**	**$98,567**	**$101,828**	**$105,088**	**$105,088**	**$105,088**	**$105,088**	**$105,088**	**$105,088**	**$105,088**

Appliance Recycling - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$49,000	$50,400	$51,800	$53,200	$53,200	$53,200	$53,200	$53,200	$53,200	$53,200
Delivery	$59,500	$61,200	$62,900	$64,600	$64,600	$64,600	$64,600	$64,600	$64,600	$64,600
Marketing	$16,275	$16,740	$17,205	$17,670	$17,670	$17,670	$17,670	$17,670	$17,670	$17,670
IT Reporting	$6,000	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Evaluation	$6,539	$6,492	$6,670	$6,849	$6,849	$6,849	$6,849	$6,849	$6,849	$6,849
Total	**$137,314**	**$136,332**	**$140,075**	**$143,819**	**$143,819**	**$143,819**	**$143,819**	**$143,819**	**$143,819**	**$143,819**

Cost-Effectiveness

Appliance Recycling - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.01	1.10	1.12	1.15	1.17	1.20	1.22	1.22	1.22	1.22
RIM Test	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.34	0.33	0.33
Utility Cost Test	1.20	1.32	1.35	1.38	1.41	1.44	1.47	1.47	1.47	1.47
Participant Cost Test	7.93	8.14	8.34	8.55	8.77	8.99	9.22	9.46	9.70	9.95

Appliance Recycling - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.04	1.11	1.13	1.16	1.18	1.21	1.23	1.23	1.23	1.23
RIM Test	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.34	0.33	0.33
Utility Cost Test	1.24	1.34	1.37	1.39	1.42	1.45	1.48	1.48	1.48	1.48
Participant Cost Test	7.96	8.16	8.37	8.58	8.80	9.02	9.25	9.49	9.73	9.98

Appliance Recycling - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.03	1.09	1.11	1.14	1.16	1.18	1.20	1.21	1.21	1.21
RIM Test	0.33	0.34	0.34	0.34	0.34	0.34	0.34	0.33	0.32	0.32
Utility Cost Test	1.10	1.17	1.20	1.22	1.25	1.27	1.29	1.30	1.30	1.30
Participant Cost Test	8.20	8.40	8.61	8.82	9.04	9.26	9.49	9.73	9.97	10.22

New Manufactured Homes

Encourage the purchase of energy efficient new manufactured homes.

Target Market

Residential customers as well home manufacturers and retailers.

Program Description

The program provides incentives to customers that purchase an energy efficient manufactured home. Two tiers of incentives are offered to residential customers:

1. *Energy Efficient Manufactured Home*. The new home must have Zone 3 insulation levels and a high efficiency air-source heat pump with a SEER ≥15 and HSPF ≥8.5.
2. *ENERGY STAR® Manufactured Homes*. These homes have increased insulation and use less energy for heating and cooling.

Kentucky Power and/or the implementation contractor should establish a network of qualified manufacturers and retailers to promote awareness of the ENERGY STAR® brand and assist with marketing the program to customers.

Implementation Strategy

Kentucky Power should engage a third-party implementation contractor to efficiently obtain the savings goals while adhering to the budget. Implementation contractor responsibilities include:

- Provide customer service support.
- Establish relationships with manufacturers and local manufactured home retailers to work with the program.
- Process rebate applications, including application review and payment of customer incentives.
- Track program performance, including customer and retailer participation as well as quality assurance/quality control (QA/QC). Pre and post inspections can be included for QA/QC.
- Periodically report progress towards program goals.
- Market the program to customers, home manufacturers, and retailers. Trade ally recruitment and enrollment.

The implementation contractor will market the program to residential customers and retailers utilizing strategies such as direct outreach, bill inserts, newspaper advertisements, email blasts, bill messaging and community events.

Risk Management

ENERGY STAR® manufactured homes must be built in compliance with the Manufactured Home Construction and Safety Standards and meets the guidelines for an ENERGY STAR® certified plant. Kentucky Power and the implementation contractor will need to work with retailers and home manufacturers to ensure that adequate stock of ENERGY STAR® manufactured homes are available to customers throughout the service territory.

Change from Current Program

The proposed program design expands upon the existing Mobile Home New Construction Program, adding an incentive for ENERGY STAR® Manufactured Homes.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions.

New Manufactured Homes - Eligible Measures and Incentives

	Unit	Average Incentive per Unit		
		Low	Mid	High
Upgraded Manufactured Home	per Household	$450	$450	$600
Energy Star Manufactured Home	per Household	$1,200	$1,200	$1,500

Estimated Participation

New Manufactured Homes - Estimated Participation, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	75	80	85	85	100	100	100	100	100	100
Energy Star Manufactured Home	35	37	39	39	45	50	55	60	65	70

New Manufactured Homes - Estimated Participation, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	85	90	95	95	115	120	125	130	135	140
Energy Star Manufactured Home	50	52	54	54	55	60	65	70	75	80

New Manufactured Homes - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	100	110	120	120	130	135	140	145	150	155
Energy Star Manufactured Home	60	62	64	64	75	80	85	90	95	100

Projected Net Energy & Demand Savings

New Manufactured Homes - Projected Net Savings per Measure

	Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Upgraded Manufactured Home	per Participant	1,520	0.878	0.485
Energy Star Manufactured Home	per Participant	2,849	0.671	0.671

New Manufactured Homes - Incremental Net Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	114	122	129	129	152	152	152	152	152	152
Energy Star Manufactured Home	100	105	111	111	128	142	157	171	185	199
Total	**214**	**227**	**240**	**240**	**280**	**294**	**309**	**323**	**337**	**351**

New Manufactured Homes - Incremental Net Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	129	137	144	144	175	182	190	198	205	213
Energy Star Manufactured Home	142	148	154	154	157	171	185	199	214	228
Total	**272**	**285**	**298**	**298**	**332**	**353**	**375**	**397**	**419**	**441**

New Manufactured Homes - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	152	167	182	182	198	205	213	220	228	236
Energy Star Manufactured Home	171	177	182	182	214	228	242	256	271	285
Total	**323**	**344**	**365**	**365**	**411**	**433**	**455**	**477**	**499**	**521**

New Manufactured Homes - Incremental Net Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	66	70	75	75	88	88	88	88	88	88
Energy Star Manufactured Home	23	25	26	26	30	34	37	40	44	47
Total	**89**	**95**	**101**	**101**	**118**	**121**	**125**	**128**	**131**	**135**

New Manufactured Homes - Incremental Net Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	75	79	83	83	101	105	110	114	118	123
Energy Star Manufactured Home	34	35	36	36	37	40	44	47	50	54
Total	**108**	**114**	**120**	**120**	**138**	**146**	**153**	**161**	**169**	**177**

New Manufactured Homes - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	88	97	105	105	114	118	123	127	132	136
Energy Star Manufactured Home	40	42	43	43	50	54	57	60	64	67
Total	**128**	**138**	**148**	**148**	**164**	**172**	**180**	**188**	**195**	**203**

New Manufactured Homes - Incremental Net Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	36	39	41	41	48	48	48	48	48	48
Energy Star Manufactured Home	23	25	26	26	30	34	37	40	44	47
Total	**60**	**64**	**67**	**67**	**79**	**82**	**85**	**89**	**92**	**95**

New Manufactured Homes - Incremental Net Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	41	44	46	46	56	58	61	63	65	68
Energy Star Manufactured Home	34	35	36	36	37	40	44	47	50	54
Total	**75**	**79**	**82**	**82**	**93**	**98**	**104**	**110**	**116**	**122**

New Manufactured Homes - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	48	53	58	58	63	65	68	70	73	75
Energy Star Manufactured Home	40	42	43	43	50	54	57	60	64	67
Total	**89**	**95**	**101**	**101**	**113**	**119**	**125**	**131**	**137**	**142**

Projected Gross Energy & Demand Savings

New Manufactured Homes - Projected Gross Savings per Measure

	Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Upgraded Manufactured Home	per home	2,342	1.352	0.747
Energy Star Manufactured Home	per home	4,390	1.034	1.034

New Manufactured Homes - Incremental Gross Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	176	187	199	199	234	234	234	234	234	234
Energy Star Manufactured Home	154	162	171	171	198	220	241	263	285	307
Total	**329**	**350**	**370**	**370**	**432**	**454**	**476**	**498**	**520**	**541**

New Manufactured Homes - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	199	211	222	222	269	281	293	304	316	328
Energy Star Manufactured Home	220	228	237	237	241	263	285	307	329	351
Total	**419**	**439**	**460**	**460**	**511**	**544**	**578**	**612**	**645**	**679**

New Manufactured Homes - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	234	258	281	281	304	316	328	340	351	363
Energy Star Manufactured Home	263	272	281	281	329	351	373	395	417	439
Total	**498**	**530**	**562**	**562**	**634**	**667**	**701**	**735**	**768**	**802**

New Manufactured Homes - Incremental Gross Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	101	108	115	115	135	135	135	135	135	135
Energy Star Manufactured Home	36	38	40	40	47	52	57	62	67	72
Total	**138**	**146**	**155**	**155**	**182**	**187**	**192**	**197**	**202**	**208**

New Manufactured Homes - Incremental Gross Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	115	122	128	128	155	162	169	176	183	189
Energy Star Manufactured Home	52	54	56	56	57	62	67	72	78	83
Total	**167**	**175**	**184**	**184**	**212**	**224**	**236**	**248**	**260**	**272**

New Manufactured Homes - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	135	149	162	162	176	183	189	196	203	210
Energy Star Manufactured Home	62	64	66	66	78	83	88	93	98	103
Total	**197**	**213**	**228**	**228**	**253**	**265**	**277**	**289**	**301**	**313**

New Manufactured Homes - Incremental Gross Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	56.0	59.8	63.5	63.5	74.7	74.7	74.7	74.7	74.7	74.7
Energy Star Manufactured Home	36.2	38.3	40.3	40.3	46.5	51.7	56.9	62.0	67.2	72.4
Total	**92**	**98**	**104**	**104**	**121**	**126**	**132**	**137**	**142**	**147**

New Manufactured Homes - Incremental Gross Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	64	67	71	71	86	90	93	97	101	105
Energy Star Manufactured Home	52	54	56	56	57	62	67	72	78	83
Total	**115**	**121**	**127**	**127**	**143**	**152**	**161**	**170**	**178**	**187**

New Manufactured Homes - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Upgraded Manufactured Home	75	82	90	90	97	101	105	108	112	116
Energy Star Manufactured Home	62	64	66	66	78	83	88	93	98	103
Total	**137**	**146**	**156**	**156**	**175**	**184**	**192**	**201**	**210**	**219**

Estimated Annual Program Budget

New Manufactured Homes - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$75,750	$80,400	$85,050	$85,050	$99,000	$105,000	$111,000	$117,000	$123,000	$129,000
Delivery	$33,000	$35,100	$37,200	$37,200	$43,500	$45,000	$46,500	$48,000	$49,500	$51,000
Marketing	$13,050	$13,860	$14,670	$14,670	$17,100	$18,000	$18,900	$19,800	$20,700	$21,600
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$6,840	$6,656	$7,034	$7,034	$8,168	$8,588	$9,008	$9,428	$9,848	$10,268
Total	**$143,640**	**$139,766**	**$147,704**	**$147,704**	**$171,518**	**$180,338**	**$189,158**	**$197,978**	**$206,798**	**$215,618**

New Manufactured Homes - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$98,250	$102,900	$107,550	$107,550	$117,750	$126,000	$134,250	$142,500	$150,750	$159,000
Delivery	$40,500	$42,600	$44,700	$44,700	$51,000	$54,000	$57,000	$60,000	$63,000	$66,000
Marketing	$16,650	$17,460	$18,270	$18,270	$20,250	$21,600	$22,950	$24,300	$25,650	$27,000
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$8,520	$8,336	$8,714	$8,714	$9,638	$10,268	$10,898	$11,528	$12,158	$12,788
Total	**$178,920**	**$175,046**	**$182,984**	**$182,984**	**$202,388**	**$215,618**	**$228,848**	**$242,078**	**$255,308**	**$268,538**

New Manufactured Homes - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$150,000	$159,000	$168,000	$168,000	$190,500	$201,000	$211,500	$222,000	$232,500	$243,000
Delivery	$48,000	$51,600	$55,200	$55,200	$61,500	$64,500	$67,500	$70,500	$73,500	$76,500
Marketing	$23,760	$25,272	$26,784	$26,784	$30,240	$31,860	$33,480	$35,100	$36,720	$38,340
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$11,838	$11,981	$12,687	$12,687	$14,300	$15,056	$15,812	$16,568	$17,324	$18,080
Total	**$248,598**	**$251,603**	**$266,421**	**$266,421**	**$300,290**	**$316,166**	**$332,042**	**$347,918**	**$363,794**	**$379,670**

Cost-Effectiveness

New Manufactured Homes - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.50	1.69	1.73	1.76	1.80	1.83	1.86	1.88	1.87	1.86
RIM Test	0.42	0.43	0.44	0.43	0.43	0.43	0.42	0.42	0.41	0.40
Utility Cost Test	1.50	1.68	1.73	1.76	1.80	1.81	1.83	1.84	1.81	1.79
Participant Cost Test	8.14	8.33	8.53	8.73	8.93	9.21	9.50	9.78	9.91	10.02

New Manufactured Homes - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.54	1.70	1.74	1.77	1.80	1.84	1.87	1.89	1.88	1.87
RIM Test	0.42	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.41
Utility Cost Test	1.51	1.66	1.70	1.73	1.80	1.82	1.85	1.86	1.85	1.83
Participant Cost Test	8.27	8.46	8.65	8.86	8.97	9.21	9.46	9.71	9.80	9.88

New Manufactured Homes - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.52	1.65	1.69	1.72	1.76	1.79	1.82	1.84	1.83	1.81
RIM Test	0.40	0.41	0.41	0.41	0.41	0.41	0.40	0.40	0.39	0.39
Utility Cost Test	1.29	1.40	1.44	1.46	1.48	1.50	1.53	1.54	1.53	1.52
Participant Cost Test	8.58	8.74	8.91	9.11	9.38	9.62	9.86	10.10	10.19	10.26

Whole House Efficiency

Encourage whole-house improvements to existing homes by promoting home energy audits and comprehensive retrofit services.

Target Market

Single family and multi-family[13] residential customers that own or rent a residence and have an electric central cooling system are eligible (i.e. central air conditioner or heat pump). Residential customers that rent a residence must receive the written approval of the homeowner/landlord to participate in the program.

Program Description

The Whole House Efficiency Program consists of 3 options:

Home Energy Audit. The customer receives an in-home energy audit and direct installation of energy conservation measures free of charge. Eligible customers must have an electric central cooling and heating system. A professional energy auditor performs a home energy audit, identifying key areas of the home that are wasting energy and provide recommendations to make the home more energy efficient. Participants are eligible to receive free installation of energy conservation measures. Eligible measures may include:

- High efficiency lighting
- Domestic hot water pipe insulation
- Water heater insulation wrap (electric DHW only)
- Low flow showerhead
- Low flow faucet aerator
- Weatherstripping / caulking / door sweep
- Duct sealing

Weatherization Measures. Customers are eligible to receive incentives for the purchase and installation of air sealing, duct sealing and insulation (attic, wall, basement sidewall and crawlspace). Customers must have an electric central cooling system to be eligible (i.e. central air conditioner or heat pump). Air and duct sealing must be performed by a participating dealer and a blower door test conducted to verify energy and demand savings. Customers may self-install insulation measures, except for attic insulation.

HVAC Equipment. Customers are eligible to receive incentives for qualifying HVAC equipment installed by a participating dealer. Qualifying measures include heat pump ductless mini splits, heat pumps and smart programmable thermostats.

Implementation Strategy

Kentucky Power should engage a third-party implementation contractor to:

- Hire/sub-contract local staff to perform home energy audits and direct measure installation. Ensure contractor certification for audit and installation services.
- Engage customers, verify customer eligibility and schedule home energy audit appointments.
- Provide customer service support.

[13] Multi-family customers include any residential unit that is not considered single family (i.e. apartment, condominium, townhome, etc.).

- Establish relationships with local contractors to work with the program, installing energy efficient HVAC equipment and weatherization measures. Includes enrollment and training as applicable.
- Process rebate applications, including application review and payment of customer and dealer rebates.
- Recommendation of incentive levels and deemed savings values associated with eligible measures.
- Track program performance, including customer and dealer participation as well as quality assurance/quality control (QA/QC). Pre and post inspections can be included for QA/QC.
- Periodically report progress towards program goals.
- Planning and implementing marketing and outreach services.

The implementation contractor will market the program to residential customers and contractors. Marketing tactics may include:

- Direct outreach to customers, including bill inserts, newspaper advertisements, email blasts, direct mail, bill messaging, and community events.
- Engage contractors to promote awareness of and use rebates to help sell qualifying equipment.

Risk Management

It is crucial to engage experienced contractors to properly install equipment and work with customers. To enroll in the program, it is recommended that contractors provide a minimum of (1) proof of insurance on an annual basis and (2) at least two customer references. KPCO and/or the implementation contractor should conduct QA/QC of a random group of completed projects by project type and contractor. The QA/QC process should include verification of the equipment installed and customer satisfaction with the contractor and the program.

A number of steps may be taken to reduce free ridership and increase spillover, including:

- Incentives will be modified as needed to respond to the market price of qualifying measures, with a goal of the incentive being no higher than 50% of the incremental cost. Incentives may be modified to increase customer participation.
- KPCO should work with the implementation contractor to properly set the rebate levels to ensure customers have adequate buy-in to the program.
- Cross-market the program with KPCO's other residential DSM programs.

Change from Current Program

The proposed program design combines the Modified Energy Fitness, High Efficiency Heat Pump and Mobile Home High Efficiency Heat Pump programs and incorporates weatherization measures.

Measures & Incentives

The measures and incentives are proposed for planning purposes and may be modified by the implementation contractor or Kentucky Power to reflect market conditions. The Home Energy Audit is provided at no cost to customers.

Whole House Efficiency - Eligible Weatherization Measures and Incentives

	Low Scenario	Mid Scenario	High Scenario
Duct Sealing 10%	$150	$200	$250
Air Sealing 20% ACH Reduction	$200	$250	$300
Air Sealing 20% ACH Reduction & Attic Insulation R-38[14]	$400	$450	$500
Wall Insulation R-13[15]	$0.30 per sq. ft., up to $250		$0.35 per sq. ft., up to $300
Basement Sidewall Insulation R-13	$0.30 per sq. ft., up to $200		$0.35 per sq. ft., up to $250
Crawlspace Insulation R-19	$0.30 per sq. ft., up to $200		$0.35 per sq. ft., up to $250

Whole House Efficiency - Eligible HVAC Equipment and Incentives

	Unit	Average Incentive per Unit		
		Low	Mid	High
Heat Pump (SEER 15, EER 12.5, HSPF 8.5)	per Unit	$300	$300	$350
Heat Pump (SEER 16, EER 13, HSPF 9)	per Unit	$450	$450	$500
Heat Pump (SEER 14 Replace Resistance Heat w/CAC)	per Unit	$300	$300	$400
Heat Pump (SEER 15 Replace Resistance Heat w/CAC)	per Unit	$600	$600	$700
Heat Pump (SEER 16 Replace Resistance Heat w/CAC)	per Unit	$900	$900	$1,000
Heat Pump Ductless Mini Split (Replace Resistance Heat)	per Unit	$400	$400	$450
Smart Programmable Thermostat w/ Heat Pump	per Unit	$45	$45	$50

Estimated Participation

Whole House Efficiency - Estimated Participation, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,400	1,500	1,600	1,700	1,800	1,825	1,850	1,875	1,900	1,925
Home Energy Audit (Multi-Family)	125	125	125	125	200	210	220	230	240	250
Weatherization	100	115	130	130	145	155	165	175	185	195
HVAC	464	523	583	642	681	730	789	828	887	936

Whole House Efficiency - Estimated Participation, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,600	1,700	1,800	1,900	2,000	2,025	2,050	2,075	2,100	2,125
Home Energy Audit (Multi-Family)	175	200	200	200	400	410	420	430	440	450
Weatherization	150	165	180	180	200	210	220	230	240	250
HVAC	572	612	683	714	753	812	861	920	959	1,008

Whole House Efficiency - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,800	1,900	2,000	2,100	2,200	2,225	2,250	2,275	2,300	2,325
Home Energy Audit (Multi-Family)	250	250	250	250	300	310	320	330	340	350
Weatherization	200	215	230	230	245	255	265	275	285	295
HVAC	679	730	812	861	920	959	1,008	1,067	1,106	1,165

[14] Existing attic insulation must be no more than R-19.
[15] Existing wall insulation must be no more than R-5.

Projected Net Energy & Demand Savings

Whole House Efficiency - Projected Net Savings per Measure

	Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Home Energy Audit (Single Family)	per Home	1,145	0.147	0.285
Home Energy Audit (Multi-Family)	per Home	1,241	0.159	0.308
Weatherization	per Unit	2,014	0.210	0.580
HVAC	per Unit	430	0.098	0.083

Whole House Efficiency - Incremental Net Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,602	1,716	1,831	1,945	1,740	1,763	1,788	1,813	1,836	1,861
Home Energy Audit (Multi-Family)	155	155	155	155	213	224	236	245	255	266
Weatherization	205	234	264	264	295	306	331	356	370	395
HVAC	187	235	285	332	371	415	462	501	548	592
Total	**2,150**	**2,341**	**2,536**	**2,696**	**2,621**	**2,708**	**2,818**	**2,914**	**3,010**	**3,113**

Whole House Efficiency - Incremental Net Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,831	1,945	2,060	2,173	1,934	1,958	1,981	2,006	2,029	2,054
Home Energy Audit (Multi-Family)	217	249	249	249	426	437	449	458	469	479
Weatherization	302	331	364	364	398	425	437	460	485	496
HVAC	246	286	341	381	420	468	511	558	597	641
Total	**2,596**	**2,810**	**3,013**	**3,167**	**3,179**	**3,288**	**3,379**	**3,482**	**3,580**	**3,670**

Whole House Efficiency - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	2,060	2,173	2,289	2,402	2,127	2,152	2,175	2,199	2,224	2,248
Home Energy Audit (Multi-Family)	310	310	310	310	320	332	342	351	363	374
Weatherization	398	430	460	460	491	514	526	560	572	598
HVAC	301	345	408	451	499	538	581	628	667	715
Total	**3,069**	**3,259**	**3,467**	**3,624**	**3,437**	**3,535**	**3,624**	**3,739**	**3,825**	**3,934**

Whole House Efficiency - Incremental Net Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	206	220	236	250	232	235	239	242	245	248
Home Energy Audit (Multi-Family)	20	20	20	20	29	30	32	33	34	35
Weatherization	23	25	28	28	30	32	34	35	38	40
HVAC	46	53	61	67	72	78	85	90	96	102
Total	**295**	**318**	**344**	**364**	**364**	**375**	**389**	**400**	**413**	**425**

Whole House Efficiency - Incremental Net Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	236	250	265	279	258	262	264	268	270	274
Home Energy Audit (Multi-Family)	28	32	32	32	57	58	61	62	63	64
Weatherization	32	34	37	37	40	42	44	46	47	49
HVAC	56	61	70	75	80	86	92	99	104	110
Total	**351**	**377**	**405**	**423**	**435**	**449**	**461**	**474**	**485**	**497**

Whole House Efficiency - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	265	279	294	308	284	287	290	294	297	300
Home Energy Audit (Multi-Family)	40	40	40	40	44	45	46	47	49	51
Weatherization	40	43	46	46	48	49	52	58	60	62
HVAC	67	73	84	90	96	101	107	114	119	125
Total	**412**	**435**	**464**	**484**	**472**	**483**	**495**	**513**	**525**	**538**

Whole House Efficiency - Incremental Net Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	400	437	466	495	481	487	494	501	508	514
Home Energy Audit (Multi-Family)	39	39	39	39	58	61	65	67	70	73
Weatherization	59	68	76	76	85	88	95	103	107	114
HVAC	38	45	53	60	64	69	76	80	87	93
Total	**535**	**588**	**634**	**670**	**689**	**706**	**731**	**751**	**771**	**794**

Whole House Efficiency - Incremental Net Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	457	495	525	554	535	541	548	555	561	568
Home Energy Audit (Multi-Family)	54	62	62	62	116	119	123	125	128	131
Weatherization	87	95	105	105	115	122	126	132	140	143
HVAC	48	52	61	66	70	77	82	89	93	99
Total	**645**	**704**	**753**	**786**	**836**	**860**	**879**	**901**	**922**	**940**

Whole House Efficiency - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	514	554	583	612	588	595	601	608	615	621
Home Energy Audit (Multi-Family)	77	77	77	77	88	91	93	96	99	102
Weatherization	115	124	132	132	142	148	152	162	165	173
HVAC	57	63	75	80	87	91	97	104	108	115
Total	**763**	**817**	**868**	**902**	**905**	**925**	**943**	**969**	**986**	**1,011**

Projected Gross Energy & Demand Savings

Whole House Efficiency - Projected Gross Savings per Measure

	Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Home Energy Audit (Single Family)	per Home	1,207	0.155	0.301
Home Energy Audit (Multi-Family)	per Home	1,309	0.168	0.325
Weatherization	per Unit	2,125	0.222	0.612
HVAC	per Unit	734	0.167	0.142

Whole House Efficiency - Incremental Gross Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,690	1,810	1,932	2,051	1,836	1,860	1,886	1,913	1,937	1,963
Home Energy Audit (Multi-Family)	164	164	164	164	225	236	249	258	269	281
Weatherization	216	247	278	278	312	322	349	375	390	416
HVAC	319	401	488	569	636	711	792	860	941	1,016
Total	**2,390**	**2,622**	**2,862**	**3,063**	**3,009**	**3,130**	**3,277**	**3,405**	**3,537**	**3,676**

Whole House Efficiency - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	1,932	2,051	2,173	2,293	2,040	2,066	2,090	2,116	2,141	2,167
Home Energy Audit (Multi-Family)	229	263	263	263	450	461	474	483	494	506
Weatherization	319	349	384	384	420	448	461	485	511	523
HVAC	420	488	584	653	721	802	877	958	1,025	1,100
Total	**2,900**	**3,152**	**3,403**	**3,592**	**3,630**	**3,777**	**3,902**	**4,042**	**4,172**	**4,296**

Whole House Efficiency - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	2,173	2,293	2,414	2,534	2,244	2,270	2,294	2,320	2,346	2,371
Home Energy Audit (Multi-Family)	327	327	327	327	338	350	361	370	383	394
Weatherization	420	454	485	485	518	542	555	591	603	631
HVAC	514	591	699	773	855	922	996	1,078	1,145	1,227
Total	**3,435**	**3,664**	**3,926**	**4,120**	**3,955**	**4,083**	**4,206**	**4,359**	**4,477**	**4,622**

Whole House Efficiency - Incremental Gross Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	218	232	249	263	245	248	252	255	258	262
Home Energy Audit (Multi-Family)	21	21	21	21	30	31	34	35	36	37
Weatherization	24	27	29	29	32	34	36	37	40	42
HVAC	78	90	103	115	123	134	145	154	165	175
Total	**341**	**370**	**402**	**428**	**431**	**446**	**466**	**481**	**499**	**516**

Whole House Efficiency - Incremental Gross Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	249	263	279	294	272	276	279	283	285	289
Home Energy Audit (Multi-Family)	29	34	34	34	60	62	64	65	66	68
Weatherization	33	36	39	39	42	45	47	48	50	51
HVAC	96	105	120	128	137	148	158	170	178	188
Total	**407**	**438**	**473**	**496**	**512**	**530**	**548**	**566**	**580**	**596**

Whole House Efficiency - Incremental Gross Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	279	294	310	325	299	303	306	310	313	316
Home Energy Audit (Multi-Family)	42	42	42	42	46	47	48	50	52	53
Duct Sealing	42	45	48	48	51	52	54	62	63	65
Air Sealing	114	124	143	153	165	173	184	195	204	215
Total	**478**	**506**	**544**	**569**	**561**	**576**	**592**	**616**	**632**	**650**

Whole House Efficiency - Incremental Gross Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	421	461	492	523	508	514	521	529	535	543
Home Energy Audit (Multi-Family)	41	41	41	41	61	65	68	70	74	77
Weatherization	62	71	80	80	90	93	101	108	112	120
HVAC	65	77	90	102	109	119	131	137	149	159
Total	**589**	**650**	**704**	**746**	**768**	**790**	**821**	**845**	**871**	**898**

Whole House Efficiency - Incremental Gross Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	482	523	554	584	564	571	578	585	592	599
Home Energy Audit (Multi-Family)	57	65	65	65	123	126	130	132	135	138
Weatherization	92	101	111	111	121	129	133	140	148	151
HVAC	81	88	105	113	119	132	141	153	160	169
Total	**711**	**777**	**834**	**873**	**927**	**958**	**981**	**1,010**	**1,034**	**1,057**

Whole House Efficiency - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Home Energy Audit (Single Family)	542	584	615	645	620	627	634	641	649	655
Home Energy Audit (Multi-Family)	81	81	81	81	92	96	99	101	105	108
Weatherization	121	131	140	140	149	157	160	171	174	182
HVAC	97	107	128	138	150	156	166	178	185	197
Total	**841**	**903**	**964**	**1,004**	**1,012**	**1,036**	**1,059**	**1,091**	**1,111**	**1,142**

Estimated Annual Program Budget

Whole House Efficiency - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$143,428	$162,620	$190,612	$208,062	$227,804	$246,796	$266,588	$285,130	$305,330	$324,472
Delivery	$552,100	$594,700	$637,450	$676,300	$738,400	$758,750	$780,600	$799,450	$821,300	$841,650
Measure Costs	$285,633	$303,890	$322,578	$340,803	$295,768	$301,000	$306,560	$311,945	$316,935	$322,678
Marketing	$90,604	$98,973	$108,684	$116,229	$126,931	$132,517	$138,448	$143,742	$149,735	$155,343
IT Reporting	$96,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Vendor Incentives	$23,200	$26,150	$29,150	$32,100	$34,050	$36,500	$39,450	$41,400	$44,350	$46,800
Evaluation	$59,548	$60,517	$65,624	$69,875	$72,348	$74,978	$77,782	$80,283	$83,082	$85,747
Total	**$1,250,513**	**$1,270,850**	**$1,378,098**	**$1,467,369**	**$1,519,300**	**$1,574,541**	**$1,633,429**	**$1,685,950**	**$1,744,732**	**$1,800,690**

Whole House Efficiency - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$188,646	$207,788	$238,630	$249,630	$270,622	$291,006	$310,656	$330,498	$349,690	$368,940
Delivery	$655,800	$703,050	$747,450	$782,100	$882,950	$904,800	$925,150	$947,000	$965,850	$986,200
Measure Costs	$333,398	$357,063	$375,768	$393,990	$359,950	$365,410	$370,708	$376,158	$381,103	$386,725
Marketing	$110,692	$119,526	$129,912	$135,860	$151,436	$157,456	$163,141	$169,080	$174,471	$180,096
IT Reporting	$96,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Vendor Incentives	$28,600	$30,600	$34,150	$35,700	$37,650	$40,600	$43,050	$46,000	$47,950	$50,400
Evaluation	$70,657	$72,101	$77,495	$81,064	$86,330	$89,164	$91,835	$94,637	$97,153	$99,818
Total	**$1,483,792**	**$1,514,128**	**$1,627,405**	**$1,702,343**	**$1,812,938**	**$1,872,436**	**$1,928,540**	**$1,987,372**	**$2,040,217**	**$2,096,179**

Whole House Efficiency - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$281,384	$305,582	$345,581	$365,431	$390,280	$412,229	$435,529	$460,076	$482,126	$505,825
Delivery	$766,850	$808,250	$854,300	$891,650	$949,250	$968,100	$988,450	$1,010,300	$1,029,150	$1,051,000
Measure Costs	$386,550	$404,785	$423,520	$441,725	$371,248	$376,870	$381,958	$387,345	$392,755	$398,193
Marketing	$138,785	$147,725	$159,732	$167,412	$178,430	$184,234	$190,467	$197,111	$202,931	$209,449
IT Reporting	$96,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Vendor Incentives	$33,950	$36,500	$40,600	$43,050	$46,000	$47,950	$50,400	$53,350	$55,300	$58,250
Evaluation	$85,176	$86,342	$92,387	$96,663	$97,960	$100,669	$103,540	$106,609	$109,313	$112,336
Total	**$1,788,695**	**$1,813,184**	**$1,940,120**	**$2,029,932**	**$2,057,167**	**$2,114,053**	**$2,174,344**	**$2,238,792**	**$2,295,576**	**$2,359,052**

Cost-Effectiveness

Whole House Efficiency - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.31	1.43	1.47	1.50	1.49	1.53	1.57	1.59	1.60	1.62
RIM Test	0.34	0.35	0.35	0.35	0.34	0.34	0.34	0.33	0.33	0.32
Utility Cost Test	1.34	1.47	1.51	1.54	1.54	1.58	1.62	1.64	1.66	1.68
Participant Cost Test	25.47	25.21	24.66	25.09	24.46	24.46	24.53	24.73	24.72	24.97

Whole House Efficiency - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.35	1.45	1.49	1.51	1.50	1.54	1.57	1.58	1.60	1.61
RIM Test	0.34	0.35	0.35	0.35	0.34	0.34	0.34	0.33	0.33	0.32
Utility Cost Test	1.38	1.49	1.53	1.55	1.54	1.58	1.62	1.63	1.65	1.67
Participant Cost Test	24.23	24.46	23.96	24.68	24.76	24.86	24.88	25.09	25.35	25.56

Whole House Efficiency - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.37	1.46	1.49	1.52	1.51	1.55	1.58	1.60	1.61	1.62
RIM Test	0.34	0.35	0.35	0.34	0.34	0.34	0.33	0.33	0.32	0.32
Utility Cost Test	1.36	1.46	1.49	1.52	1.51	1.55	1.58	1.60	1.61	1.63
Participant Cost Test	23.46	23.63	23.12	23.69	23.18	23.49	23.64	23.96	24.24	24.54

Residential Home Performance

Reduce consumption via socially- and information-driven behavioral change and raise general awareness of energy efficiency and Kentucky Power's DSM programs.

Target Market

Residential single family homes.

Program Description

The program provides individualized energy use information to customers while simultaneously offering recommendations on how to save energy and money by making small changes to energy consuming behaviors. Energy reports are periodically sent to customer households to give them self-awareness and a peer comparison of their energy usage. Customers are also provided access to an online tool to track energy consumption and offer tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.

Implementation Strategy

KPCO should select an implementation contractor that specializes in developing and issuing residential energy reports. The implementation contractor will utilize experimental design to select report recipients and a control group, design the reports and develop customized energy reduction tips with input from KPCO. The program should cross-promote and market the DSM portfolio.

Risk Management

Customer attrition may reduce the potential achievable program savings. The implementation contractor may account for customer attrition by adding new customers each year during designated periods.

The program provides a significant opportunity to promote the residential DSM programs, thereby resulting in increased program spillover. However, the spillover impact will need to be carefully determined through an impact evaluation.

Change from Current Program

n/a

Measures & Incentives

Customers receive energy reports, there is no monetary incentive.

Estimated Participation

Home Performance – Project Participation

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	60,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000
Mid Scenario	60,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000
High Scenario	60,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000

Projected Net Energy & Demand Savings Target

Home Performance - Incremental Net Savings per Participant

Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit
160	0.024

Home Performance - Incremental Net Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
Mid Scenario	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760
High Scenario	9,604	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760	11,760

Home Performance - Incremental Net Summer Peak Demand Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
Mid Scenario	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352
High Scenario	1,421	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352	2,352

Projected Gross Energy & Demand Savings Target

Home Performance - Incremental Gross Savings per Participant

Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit
163	0.024

Home Performance - Incremental Gross Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Mid Scenario	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
High Scenario	9,800	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000

Home Performance - Incremental Gross Summer Peak Demand Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Mid Scenario	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
High Scenario	1,450	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400

Estimated Program Budget

Home Performance - Estimated Annual Budget

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$595,000	$595,000	$595,000	$595,000	$595,000	$595,000	$595,000	$595,000	$595,000	$595,000
IT Reporting	$6,000	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Evaluation	$30,050	$29,825	$29,825	$29,825	$29,825	$29,825	$29,825	$29,825	$29,825	$29,825
Total	**$631,050**	**$626,325**	**$626,325**	**$626,325**	**$626,325**	**$626,325**	**$626,325**	**$626,325**	**$626,325**	**$626,325**

Cost-Effectiveness

Home Performance - Cost-Effectiveness

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.72	2.32	2.39	2.42	2.47	2.62	2.75	2.77	2.80	2.82
RIM Test	0.38	0.42	0.42	0.42	0.42	0.43	0.44	0.44	0.43	0.42
Utility Cost Test	1.72	2.32	2.39	2.42	2.47	2.62	2.75	2.77	2.80	2.82
Participant Cost Test	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Targeted Energy Efficiency

Deliver long-term energy savings and bill reductions to income-qualified customers.

Target Market

Residential customers that meet the federal poverty guidelines.

Program Description

The program provides weatherization and energy efficiency services to qualifying residential customers who need help reducing their energy bills and improving their homes' safety and comfort. Kentucky Power provides funding for this program through the Kentucky Community Action network of not-for-profit community action agencies to subsidize the work completed by the community action agencies. Program services include residential energy audits, the installation of home weatherization/energy conservation items and customer education on home energy efficiency. The home weatherization/energy conservation measures may include:

- High efficiency lighting
- Domestic hot water pipe insulation
- Water heater insulation wrap (electric DHW only)
- Low flow showerhead
- Low flow faucet aerator
- Air and duct sealing (electric heat only)
- Insulation (electric heat only)
- Efficient windows and doors
- Air source heat pump

To be eligible to participate:

- Household income cannot exceed the designated federal poverty guidelines.
- Customers must have primary electric heat and use an average of 700 kWh per month.
- Customers without primary electric heating may be eligible for limited efficiency measures if they have electric water heating and use an average of 700 kWh per month from November through March.

Implementation Strategy

Kentucky Power should continue to work with the Kentucky Community Action network to engage customers and implement the programs. Community action agency responsibilities include:

- Engage customers, verify customer eligibility and schedule appointments.
- Hire/sub-contract local staff to perform home energy audits and measure installation.
- Provide customer service support.
- Track program performance and periodically report progress towards program goals.
- Marketing the program to eligible customers.
- Educating customers on the benefits of the program and the Kentucky Power DSM programs available to eligible residential customers.
- Utilize funds to support more customer participation.

Risk Management

The program focuses on providing energy efficiency services to low-income residents to ensure reduced consumption. There is little risk associated with this product. The Kentucky Community Action network relies on funding from multiple organizations to provide weatherization services to low-income residents. The organizations typically have different funding requirements. Kentucky Power works with the Community Action network to streamline their funding requirements and maximize the number of customers that participate in the program.[16]

Change from Current Program

The proposed program design expands upon the existing program, adding windows and doors as eligible measures and increasing the cost per home to $2,000.

Measures & Incentives

There are no monetary incentives, all measures are installed free of charge.

Estimated Participation

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	150	150	150	150	150	150	150	150	150	150
Mid Scenario	175	175	175	175	175	175	175	175	175	175
High Scenario	200	200	200	200	200	200	200	200	200	200

Projected Net Energy & Demand Savings

Targeted Energy Efficiency - Projected Net Savings per Home

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
per Participant	2,534	0.546	0.056

Targeted Energy Efficiency - Incremental Net Savings, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	379	379	379	379	374	374	374	374	374	374
Summer Peak Savings (kW)	57.8	57.8	57.8	57.8	57.2	57.2	57.2	57.2	57.2	57.2
Winter Peak Savings (kW)	116.9	117.1	117.1	117.1	116.3	116.3	116.3	116.3	116.3	116.3

Targeted Energy Efficiency - Incremental Net Savings, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	443	443	443	443	437	437	437	437	437	437
Summer Peak Savings (kW)	68.9	68.9	68.9	68.9	68.2	68.2	68.2	68.2	68.2	68.2
Winter Peak Savings (kW)	136.9	137.2	137.2	137.2	136.2	136.2	136.2	136.2	136.2	136.2

Targeted Energy Efficiency - Incremental Net Savings, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	508	508	508	508	501	501	501	501	501	501
Summer Peak Savings (kW)	77.2	77.2	77.2	77.2	76.4	76.4	76.4	76.4	76.4	76.4
Winter Peak Savings (kW)	156.9	157.2	157.2	157.2	156.1	156.1	156.1	156.1	156.1	156.1

Projected Gross Energy & Demand Savings

Targeted Energy Efficiency - Projected Gross Savings per Home

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
per Participant	3,008	0.467	0.928

[16] Average program target spend per household will range from $1,500-$2,000, or as deemed cost-effective.

Targeted Energy Efficiency - Incremental Gross Savings, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	450	450	450	450	444	444	444	444	444	444
Summer Peak Savings (kW)	68.6	68.6	68.6	68.6	67.9	67.9	67.9	67.9	67.9	67.9
Winter Peak Savings (kW)	138.8	139.0	139.0	139.0	138.1	138.1	138.1	138.1	138.1	138.1

Targeted Energy Efficiency - Incremental Gross Savings, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	526	526	526	526	519	519	519	519	519	519
Summer Peak Savings (kW)	81.8	81.8	81.8	81.8	81.0	81.0	81.0	81.0	81.0	81.0
Winter Peak Savings (kW)	162.5	162.8	162.8	162.8	161.6	161.6	161.6	161.6	161.6	161.6

Targeted Energy Efficiency - Incremental Gross Savings, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Savings (MWh)	603	603	603	603	595	595	595	595	595	595
Summer Peak Savings (kW)	91.6	91.6	91.6	91.6	90.7	90.7	90.7	90.7	90.7	90.7
Winter Peak Savings (kW)	186.2	186.6	186.6	186.6	185.3	185.3	185.3	185.3	185.3	185.3

Estimated Annual Program Budget

Targeted Energy Efficiency - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$123,750	$123,750	$123,750	$123,750	$123,750	$123,750	$123,750	$123,750	$123,750	$123,750
Measure Costs	$170,064	$170,064	$170,064	$170,064	$168,624	$168,624	$168,624	$168,624	$168,624	$168,624
Evaluation	$14,691	$14,691	$14,691	$14,691	$14,619	$14,619	$14,619	$14,619	$14,619	$14,619
Total	**$308,504**	**$308,504**	**$308,504**	**$308,504**	**$306,992**	**$306,992**	**$306,992**	**$306,992**	**$306,992**	**$306,992**

Targeted Energy Efficiency - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$146,250	$146,250	$146,250	$146,250	$146,250	$146,250	$146,250	$146,250	$146,250	$146,250
Measure Costs	$203,960	$203,960	$203,960	$203,960	$202,280	$202,280	$202,280	$202,280	$202,280	$202,280
Evaluation	$17,511	$17,511	$17,511	$17,511	$17,427	$17,427	$17,427	$17,427	$17,427	$17,427
Total	**$367,721**	**$367,721**	**$367,721**	**$367,721**	**$365,957**	**$365,957**	**$365,957**	**$365,957**	**$365,957**	**$365,957**

Targeted Energy Efficiency - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$168,750	$168,750	$168,750	$168,750	$168,750	$168,750	$168,750	$168,750	$168,750	$168,750
Measure Costs	$237,475	$237,475	$237,475	$237,475	$235,555	$235,555	$235,555	$235,555	$235,555	$235,555
Evaluation	$20,311	$20,311	$20,311	$20,311	$20,215	$20,215	$20,215	$20,215	$20,215	$20,215
Total	**$426,536**	**$426,536**	**$426,536**	**$426,536**	**$424,520**	**$424,520**	**$424,520**	**$424,520**	**$424,520**	**$424,520**

Cost-Effectiveness

Targeted Energy Efficiency - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.05	1.08	1.09	1.11	1.12	1.14	1.16	1.17	1.16	1.16
RIM Test	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.30	0.30
Utility Cost Test	1.05	1.08	1.09	1.11	1.12	1.14	1.16	1.17	1.16	1.16
Participant Cost Test	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Targeted Energy Efficiency - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.06	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.17	1.16
RIM Test	0.32	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.30	0.30
Utility Cost Test	1.06	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.17	1.16
Participant Cost Test	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Targeted Energy Efficiency - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.06	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.17	1.16
RIM Test	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.30	0.30
Utility Cost Test	1.06	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.17	1.16
Participant Cost Test	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Commercial Incentive Program

Encourage commercial customers to purchase and install energy efficient equipment.

Target Market

All commercial customers. Industrial customers that contribute to the DSM charge may be eligible to participate in the program.

Program Description

The program is designed to help commercial customers save energy through a broad range of energy efficiency options that address all major end uses and processes.

- *Prescriptive Rebates*. Participants select energy efficient equipment from a pre-qualified list. Rebates are issued to upon completion of the project and submission of the rebate application. The measures incentivized, including lighting, HVAC equipment and motors, are proven technologies that are readily available with known performance characteristics.
- *Custom Rebates*. Equipment that does not qualify for a prescriptive rebate is eligible for a custom rebate. Applications must be pre-approved by the implementation contractor before the equipment is purchased and installed and projects must have a Total Resource Cost Test benefit-cost ratio of at least 1.0.

Rebates per year are limited to $20,000 per customer. Multiple rebate applications for different measures may be submitted. Rebates are issued upon completion of the project.

Implementation Strategy

Kentucky Power should engage a third-party implementation contractor to:

- Process customer applications; verify customer and project eligibility and process rebates.
- Conduct QA/QC to verify equipment installation.
- Provide customer service support.
- Track program performance.
- Routinely report progress towards program goals and opportunities for improvement.
- Provide marketing strategy with marketing services to achieve program goals.

Key pillars of the marketing strategy include dealers and direct customer marketing, including direct mail, newspaper advertisements, email blasts, bill inserts and HVAC trade publications. Additional marketing tactics include:

- Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. The implementation contractor will coordinate with the support of KPCO to specific associations to highlight suitable program offerings.
- Highlight successfully completed projects with formal case studies to display the process and benefits of the program. This type of marketing typically spurs the customer's competitors to improve building performance and increase business process efficiency.

Risk Management

The key barriers are return on investment, decision timing and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough vendors are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.

Measure savings are expected to be updated annually. Potential changes to measure savings, costs, and other key assumptions could affect the measure's ability to pass cost-effectiveness tests. Therefore, the mix of measures that can be offered could change from year to year to reflect changes made to the original measure attributes.

Incentives will be modified as needed to respond to market prices, with a goal of the incentive being no higher than 50% of the incremental cost. Proper incentives can reduce free ridership while still encouraging customers to participate in the program.

Change from Current Program

The proposed program design separates Commercial Incentive from Express Install and New Construction.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions. Rebates per year are limited to $20,000 per customer. Kentucky Power may revise the payback range and/or the maximum incentive per project based upon program implementation contractor recommendations and/or overall customer response to the program.

The custom rebate is set at $0.08 per first year kWh, not to exceed 50% of the total project cost. The high scenario incentive is set at $0.10 per first year kWh.

Commercial Incentive Program - Eligible Prescriptive Measures and Incentives

	Unit	Average Incentive per Unit	
		Low/Mid Scenario	High Scenario
Lighting Optimization - Remove 4ft Lamp from T8 System	per unit	$6	$8
Lighting Optimization - Remove 8ft Lamp from T8 System	per unit	$8	$10
High Bay Fluorescent Fixture w/ HE Electronic Ballast T5	per unit	$50	$60
High Bay Fluorescent Fixture (HP T8)	per unit	$100	$120
Low Wattage T8 Lamp	per unit	$15	$18
Omnidirectional LED Bulb (≥10W)	per unit	$15	$18
Omnidirectional LED Bulb (≥10W)	per unit	$20	$14
Directional LED Bulb (<15W)	per unit	$20	$14
Directional LED Bulb (≥15W)	per unit	$25	$30
LED High & Low-Bay Fixture	per unit	$100	$120
LED Wall Mounted Area Lights (<30W)	per unit	$50	$60
LED Wall Mounted Area Lights (30-75W)	per unit	$100	$120
LED Wall Mounted Area Lights (≥75W)	per unit	$150	$180
LED Flood Light (<15W)	per unit	$15	$18
LED Flood Light (≥15W)	per unit	$20	$24
LED Exit Sign	per unit	$15	$18
Photocell Occupancy Sensor	per unit	$30	$36
Wall-Mount Occupancy Sensor	per unit	$20	$24
Air Cooled Chiller	per Ton	$50	$60
Water Cooled Chiller, Rotary Screw & Roll	per Ton	$50	$60
Water Cooled Chiller, Centrifugal	per Ton	$25	$30
Air Source Heat Pump (<65 kBtuh)	per Ton	$50	$60
Water Source Heat Pump	per Ton	$50	$60
PTAC/PTHP	per Ton	$40	$48
Variable Speed Drives for HVAC Systems	per unit	$950	$1,100
Automatic Door Closer for Walk-In Cooler/Freezer	per unit	$75	$90
Beverage & Snack Machine Controls (Refrigerated)	per unit	$75	$90
ECM for Walk-In Cooler or Freezer	per unit	$25	$30
ENERGY STAR Electric Steamer	per unit	$300	$360
ENERGY STAR Commercial Dishwasher	per unit	$25	$30
High Efficiency Pre-Rinse Spray Valve	per unit	$50	$60
ENERGY STAR Electric Fryer	per unit	$100	$120
Demand Control Ventilation	per unit	$950	$1,100
No Air Loss Drain	per Drain	$350	$400

Estimated Participation

Commercial Incentive Program - Estimated Participation, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	140	145	150	150	155	160	165	170	175	180
Custom	20	22	24	24	26	27	28	29	30	31

Commercial Incentive Program - Estimated Participation, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	150	155	160	175	180	185	190	195	200	205
Custom	20	22	24	29	31	32	33	34	35	36

Commercial Incentive Program - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	180	185	190	190	195	200	205	210	215	220
Custom	30	32	34	34	36	37	38	39	40	41

Projected Net Energy & Demand Savings

Commercial Incentive Program - Projected Net Savings per Measure

	Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Prescriptive	per Project	14,713	2.844	2.535
Custom	per Project	41,119	6.813	6.813

Commercial Incentive Program - Incremental Net Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	2,064	2,138	2,207	2,207	2,234	2,282	2,355	2,480	2,548	2,596
Custom	822	905	987	987	1,069	1,110	1,151	1,192	1,234	1,275
Total	**2,886**	**3,042**	**3,194**	**3,194**	**3,303**	**3,392**	**3,506**	**3,673**	**3,781**	**3,870**

Commercial Incentive Program - Incremental Net Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	2,207	2,276	2,326	2,595	2,596	2,671	2,739	2,808	2,856	2,961
Custom	822	905	987	1,192	1,275	1,316	1,357	1,398	1,439	1,480
Total	**3,029**	**3,181**	**3,313**	**3,788**	**3,870**	**3,986**	**4,096**	**4,206**	**4,295**	**4,441**

Commercial Incentive Program - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	2,645	2,721	2,791	2,791	2,808	2,856	2,961	3,025	3,434	3,483
Custom	1,234	1,316	1,398	1,398	1,480	1,521	1,563	1,604	1,645	1,686
Total	**3,878**	**4,037**	**4,189**	**4,189**	**4,288**	**4,378**	**4,523**	**4,629**	**5,079**	**5,169**

Commercial Incentive Program - Incremental Net Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	401	414	427	427	430	440	454	492	505	515
Custom	136	150	164	164	177	184	191	198	204	211
Total	**537**	**564**	**590**	**590**	**607**	**624**	**644**	**690**	**709**	**727**

Commercial Incentive Program - Incremental Net Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	427	439	450	515	515	529	541	554	565	581
Custom	136	150	164	198	211	218	225	232	238	245
Total	**563**	**589**	**614**	**713**	**727**	**747**	**766**	**786**	**803**	**826**

Commercial Incentive Program - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	526	540	553	553	554	565	581	593	659	670
Custom	204	218	232	232	245	252	259	266	273	279
Total	**731**	**758**	**784**	**784**	**799**	**817**	**839**	**858**	**932**	**949**

Commercial Incentive Program - Incremental Net Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	354	368	380	380	383	394	407	421	433	444
Custom	136	150	164	164	177	184	191	198	204	211
Total	**491**	**518**	**544**	**544**	**561**	**578**	**598**	**618**	**638**	**655**

Commercial Incentive Program - Incremental Net Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	380	393	404	444	444	457	469	482	492	508
Custom	136	150	164	198	211	218	225	232	238	245
Total	**517**	**543**	**567**	**641**	**655**	**675**	**694**	**714**	**731**	**753**

Commercial Incentive Program - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	455	468	481	481	482	492	508	519	532	542
Custom	204	218	232	232	245	252	259	266	273	279
Total	**659**	**686**	**713**	**713**	**727**	**745**	**766**	**785**	**804**	**822**

Projected Gross Energy & Demand Savings

Commercial Incentive Program - Projected Gross Savings per Measure

	Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Prescriptive	per Project	17,628	3.41	3.04
Custom	per Project	49,266	8.16	8.16

Commercial Incentive Program - Incremental Gross Energy Savings (MWh), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	2,473	2,561	2,644	2,644	2,676	2,734	2,822	2,972	3,052	3,110
Custom	985	1,084	1,182	1,182	1,281	1,330	1,379	1,429	1,478	1,527
Total	**3,458**	**3,645**	**3,827**	**3,827**	**3,957**	**4,064**	**4,201**	**4,400**	**4,530**	**4,637**

Commercial Incentive Program - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	2,644	2,727	2,786	3,109	3,110	3,200	3,281	3,364	3,422	3,547
Custom	985	1,084	1,182	1,429	1,527	1,577	1,626	1,675	1,724	1,774
Total	**3,629**	**3,811**	**3,969**	**4,538**	**4,637**	**4,776**	**4,907**	**5,039**	**5,146**	**5,321**

Commercial Incentive Program - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	3,169	3,260	3,343	3,343	3,364	3,422	3,547	3,625	4,114	4,173
Custom	1,478	1,577	1,675	1,675	1,774	1,823	1,872	1,921	1,971	2,020
Total	**4,647**	**4,837**	**5,019**	**5,019**	**5,138**	**5,245**	**5,419**	**5,546**	**6,085**	**6,193**

Commercial Incentive Program - Incremental Gross Summer Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	480	496	511	511	515	528	543	590	605	618
Custom	163	180	196	196	212	220	229	237	245	253
Total	**643**	**676**	**707**	**707**	**727**	**748**	**772**	**827**	**850**	**871**

Commercial Incentive Program - Incremental Gross Summer Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	511	526	539	618	618	633	648	664	676	696
Custom	163	180	196	237	253	261	269	278	286	294
Total	**674**	**706**	**735**	**854**	**871**	**895**	**918**	**941**	**962**	**989**

Commercial Incentive Program - Incremental Gross Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	631	647	662	662	664	676	696	710	790	803
Custom	245	261	278	278	294	302	310	318	327	335
Total	**876**	**908**	**940**	**940**	**957**	**978**	**1,006**	**1,028**	**1,117**	**1,137**

Commercial Incentive Program - Incremental Gross Winter Peak Savings (kW), Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	425	441	456	456	459	472	488	504	519	532
Custom	163	180	196	196	212	220	229	237	245	253
Total	**588**	**620**	**652**	**652**	**672**	**692**	**716**	**741**	**764**	**785**

Commercial Incentive Program - Incremental Gross Winter Peak Savings (kW), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	456	471	484	532	532	547	562	577	590	608
Custom	163	180	196	237	253	261	269	278	286	294
Total	**619**	**650**	**680**	**769**	**785**	**809**	**832**	**855**	**876**	**902**

Commercial Incentive Program - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prescriptive	545	561	576	576	577	590	608	622	637	650
Custom	245	261	278	278	294	302	310	318	327	335
Total	**790**	**822**	**854**	**854**	**871**	**892**	**918**	**941**	**964**	**984**

Estimated Annual Program Budget

Commercial Incentive Program - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$371,941	$389,076	$406,090	$406,090	$414,325	$424,833	$438,478	$467,198	$480,463	$491,001
Delivery	$265,520	$275,180	$285,360	$285,360	$275,100	$282,090	$290,440	$311,270	$319,380	$326,370
Marketing	$50,997	$53,140	$55,316	$55,316	$55,154	$56,554	$58,313	$62,277	$63,987	$65,390
IT Reporting	$87,000	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750
Evaluation	$38,773	$36,957	$38,426	$38,426	$38,316	$39,261	$40,449	$43,125	$44,279	$45,226
Total	**$814,231**	**$776,104**	**$806,942**	**$806,942**	**$804,646**	**$824,488**	**$849,431**	**$905,620**	**$929,860**	**$949,736**

Commercial Incentive Program - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$392,932	$409,847	$423,924	$486,974	$491,001	$504,771	$518,661	$532,356	$542,894	$558,460
Delivery	$282,360	$291,940	$300,320	$341,030	$326,370	$334,840	$343,510	$351,740	$358,730	$368,200
Marketing	$54,023	$56,143	$57,940	$66,240	$65,390	$67,169	$68,974	$70,728	$72,130	$74,133
IT Reporting	$87,000	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750
Evaluation	$40,816	$38,984	$40,197	$45,800	$45,226	$46,427	$47,645	$48,829	$49,775	$51,127
Total	**$857,131**	**$818,664**	**$844,130**	**$961,794**	**$949,736**	**$974,957**	**$1,000,539**	**$1,025,403**	**$1,045,279**	**$1,073,669**

Commercial Incentive Program - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$595,701	$616,618	$637,726	$637,726	$648,549	$661,297	$680,000	$695,736	$767,725	$780,467
Delivery	$348,660	$358,520	$368,580	$368,580	$353,240	$360,230	$369,700	$378,410	$457,600	$464,550
Marketing	$75,549	$78,011	$80,505	$80,505	$80,143	$81,722	$83,976	$85,932	$98,026	$99,601
IT Reporting	$87,000	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750	$21,750
Evaluation	$55,346	$53,745	$55,428	$55,428	$55,184	$56,250	$57,771	$59,091	$67,255	$68,318
Total	**$1,162,256**	**$1,128,644**	**$1,163,989**	**$1,163,989**	**$1,158,866**	**$1,181,249**	**$1,213,197**	**$1,240,919**	**$1,412,356**	**$1,434,687**

Cost-Effectiveness

Commercial Incentive Program - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.56	1.71	1.75	1.78	1.86	1.89	1.91	1.90	1.91	1.92
RIM Test	0.60	0.62	0.62	0.61	0.62	0.61	0.61	0.60	0.59	0.58
Utility Cost Test	2.19	2.48	2.55	2.58	2.73	2.77	2.82	2.80	2.81	2.83
Participant Cost Test	6.53	6.71	6.88	7.04	7.29	7.47	7.66	7.69	7.88	8.08

Commercial Incentive Program - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.55	1.70	1.74	1.76	1.84	1.87	1.92	1.93	1.94	1.95
RIM Test	0.60	0.62	0.62	0.62	0.62	0.61	0.61	0.60	0.59	0.58
Utility Cost Test	2.18	2.45	2.52	2.58	2.72	2.76	2.83	2.85	2.87	2.89
Participant Cost Test	6.50	6.68	6.86	6.93	7.17	7.36	7.59	7.78	7.97	8.19

Commercial Incentive Program - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.58	1.70	1.76	1.79	1.86	1.89	1.92	1.93	1.91	1.92
RIM Test	0.59	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.57	0.56
Utility Cost Test	2.06	2.26	2.34	2.38	2.49	2.53	2.57	2.58	2.52	2.53
Participant Cost Test	6.57	6.74	6.96	7.13	7.37	7.55	7.75	7.93	8.30	8.50

Express Install

Provide targeted, highly cost-effective measures to small commercial customers.

Target Market

Small commercial customers with an average electric demand of less than 100 kW per year.

Program Description

The program offers small commercial customers an energy assessment that includes information on potential energy savings and anticipated payback as well as incentives that cover up to 70% percent of the equipment and installation costs. Eligible measures include, but are not limited to, lighting and refrigeration measures. The program works best if the assessment and any applicable equipment and measure installations can be completed on the same day.

The implementation strategy incorporates the following components:

- *Walk-Through Audits.* Trained auditors complete a walk-through examination of the business using standard audit software, identifying specific energy saving opportunities. The auditor reviews the anticipated costs and savings of the measures, along with information on financial resources available to help defray costs. Customers are provided with a report and check list of recommendations from the audit.
- *Direct Installation of Measures.* Upon customer approval of a job scope, the implementation contractor installs pertinent measures identified during the audit on the same day as the audit, if possible.
- *Customer Education.* Customers are educated on energy efficient equipment and KPCO's full suite of DSM programs. Particular attention is paid to the areas identified in the audit.

Kentucky Power should select an implementation contractor that conducts the energy assessment and provides information on incentives. The incentives are assigned directly to the contractor, so that the value of utility incentives is reduced directly from the project cost. The program is part of a long-term strategy to raise awareness of energy savings opportunities among commercial customers and to help them take action using incentives offered by KPCO.

Implementation Strategy

Kentucky Power should hire an implementation contractor to:

- Hire qualified, local individuals to conduct energy audits and install efficient lighting equipment. Provide training, ongoing as needed, to auditors.
- Ensure that auditors are familiar with all KPCO DSM programs available to customers.
- Development of program materials including forms, application, training documents.
- Program marketing and outreach. Development and media placement of marketing materials including with trade associations.
- Provide customer service support.
- Track program performance, including audit requests, audit activities and customer actions. Pre and post inspections can be included for QA/QC.
- Periodically report progress towards program goals and opportunities for improvement.

The marketing and outreach strategies will include direct customer marketing such as bill inserts, newsletters, email, and on-bill messaging. The auditors market the program directly to customers. Successful projects should be highlighted to display the benefits of the program.

Risk Management

Small commercial customers are typically a hard-to-reach market without the time available to become educated on energy efficient equipment and the money available to upgrade to efficient equipment.

One potential risk is a limited supply of qualified individuals with the skills to conduct audits and market energy efficiency improvements. A solution is the development of a local network of qualified professionals to provide audit and installation services and to promote the program to customers. The implementation contractor will:

- Offer technical training to auditors, including classroom and field sessions.
- Offer sales and business process training to help contractors succeed in selling and delivering energy efficiency services.

Change from Current Program

The proposed program design separates Express Install from the Commercial Incentive program.

Measures & Incentives

Incentives were set for planning purposes and may be modified to reflect market conditions. Incentives cover up to 70% percent of the equipment and installation costs.

Estimated Participation

Express Install - Estimated Participation

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	35	40	45	45	50	55	60	65	70	75
Mid Scenario	40	45	50	50	60	65	70	75	80	85
High Scenario	45	50	55	60	65	70	75	80	85	90

Projected Net Energy & Demand Savings

Express Install - Projected Net Savings per Project

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
per Project	17,771	2.800	2.80

Express Install - Incremental Net Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	622	711	800	800	889	977	1,066	1,155	1,244	1,333
Mid Scenario	711	800	889	889	1,066	1,155	1,244	1,333	1,422	1,511
High Scenario	800	889	977	1,066	1,155	1,244	1,333	1,422	1,511	1,599

Express Install - Incremental Net Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	98.0	112.0	126.0	126.0	140.0	154.0	168.0	182.0	196.0	210.0
Mid Scenario	112.0	126.0	140.0	140.0	168.0	182.0	196.0	210.0	224.0	238.0
High Scenario	126.0	140.0	154.0	168.0	182.0	196.0	210.0	224.0	238.0	252.0

Express Install - Incremental Net Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	98.0	112.0	126.0	126.0	140.0	154.0	168.0	182.0	196.0	210.0
Mid Scenario	112.0	126.0	140.0	140.0	168.0	182.0	196.0	210.0	224.0	238.0
High Scenario	126.0	140.0	154.0	168.0	182.0	196.0	210.0	224.0	238.0	252.0

Projected Gross Energy & Demand Savings

Express Install - Projected Gross Savings per Project

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
per Project	21,292	3.354	3.354

Express Install - Incremental Gross Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	745	852	958	958	1,065	1,171	1,278	1,384	1,490	1,597
Mid Scenario	852	958	1,065	1,065	1,278	1,384	1,490	1,597	1,703	1,810
High Scenario	958	1,065	1,171	1,278	1,384	1,490	1,597	1,703	1,810	1,916

Express Install - Incremental Gross Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	117.4	134.2	150.9	150.9	167.7	184.5	201.3	218.0	234.8	251.6
Mid Scenario	134.2	150.9	167.7	167.7	201.3	218.0	234.8	251.6	268.3	285.1
High Scenario	150.9	167.7	184.5	201.3	218.0	234.8	251.6	268.3	285.1	301.9

Express Install - Incremental Gross Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	117.4	134.2	150.9	150.9	167.7	184.5	201.3	218.0	234.8	251.6
Mid Scenario	134.2	150.9	167.7	167.7	201.3	218.0	234.8	251.6	268.3	285.1
High Scenario	151	168	184	201	218	235	252	268	285	302

Estimated Annual Program Budget

Express Install - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$129,850	$148,400	$166,950	$166,950	$185,500	$204,050	$222,600	$241,150	$259,700	$278,250
Delivery	$174,156	$199,036	$223,915	$223,915	$248,795	$273,674	$298,554	$323,433	$348,312	$373,192
Marketing	$24,320	$27,795	$31,269	$31,269	$34,744	$38,218	$41,692	$45,167	$48,641	$52,115
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$17,166	$18,949	$21,294	$21,294	$23,639	$25,985	$28,330	$30,675	$33,020	$35,365
Total	**$360,493**	**$397,930**	**$447,179**	**$447,179**	**$496,428**	**$545,677**	**$594,926**	**$644,175**	**$693,424**	**$742,673**

Express Install - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$148,400	$166,950	$185,500	$185,500	$222,600	$241,150	$259,700	$278,250	$296,800	$315,350
Delivery	$199,036	$223,915	$248,795	$248,795	$298,554	$323,433	$348,312	$373,192	$398,071	$422,951
Marketing	$27,795	$31,269	$34,744	$34,744	$41,692	$45,167	$48,641	$52,115	$55,590	$59,064
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$19,512	$21,294	$23,639	$23,639	$28,330	$30,675	$33,020	$35,365	$37,711	$40,056
Total	**$409,742**	**$447,179**	**$496,428**	**$496,428**	**$594,926**	**$644,175**	**$693,424**	**$742,673**	**$791,922**	**$841,171**

Express Install - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$166,950	$185,500	$204,050	$222,600	$241,150	$259,700	$278,250	$296,800	$315,350	$333,900
Delivery	$223,915	$248,795	$273,674	$298,554	$323,433	$348,312	$373,192	$398,071	$422,951	$447,830
Marketing	$31,269	$34,744	$38,218	$41,692	$45,167	$48,641	$52,115	$55,590	$59,064	$62,538
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$21,857	$23,639	$25,985	$28,330	$30,675	$33,020	$35,365	$37,711	$40,056	$42,401
Total	**$458,991**	**$496,428**	**$545,677**	**$594,926**	**$644,175**	**$693,424**	**$742,673**	**$791,922**	**$841,171**	**$890,420**

Cost-Effectiveness

Express Install - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.00	1.06	1.07	1.09	1.10	1.12	1.13	1.14	1.14	1.15
RIM Test	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.44
Utility Cost Test	1.07	1.13	1.15	1.17	1.18	1.20	1.22	1.22	1.23	1.23
Participant Cost Test	7.00	7.16	7.33	7.50	7.67	7.85	8.03	8.22	8.41	8.61

Express Install - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.01	1.06	1.08	1.09	1.11	1.12	1.14	1.14	1.14	1.15
RIM Test	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.44
Utility Cost Test	1.08	1.13	1.15	1.17	1.19	1.20	1.22	1.22	1.23	1.23
Participant Cost Test	7.00	7.16	7.33	7.50	7.67	7.85	8.03	8.22	8.41	8.61

Express Install - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.01	1.06	1.08	1.09	1.11	1.12	1.14	1.14	1.14	1.15
RIM Test	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.44
Utility Cost Test	1.08	1.13	1.15	1.17	1.19	1.20	1.22	1.22	1.23	1.23
Participant Cost Test	7.00	7.16	7.33	7.50	7.67	7.85	8.03	8.22	8.41	8.61

New Construction

Encourage decision-makers in new construction and major renovation projects to incorporate greater energy efficiency into their building design and construction practices.

Target Market

All commercial customers and commercial builders.

Program Description

The program is designed to encourage decision-makers in new construction and major renovation projects to incorporate greater energy efficiency into their building design and construction practices. Eligible customers may participate through one of two approaches:

- *Whole Building Approach.* This approach is ideal for projects pursuing integrated design and demonstrating high performance goals through energy simulation modeling. Early design intervention and a holistic building design enhance savings and optimize building performance. Incentives are only available for projects that are at least 10 percent more energy efficient than a baseline building designed to ASHRAE 90.1-2007 Standards, Appendix G. Applicants must provide an energy simulation model utilizing software programs that estimate annual energy savings.
- *Systems Approach.* This approach encourages designers to optimize individual systems to increase building energy efficiency. This approach offers a flexible solution for less complex projects. Throughout the design phase, simple spreadsheet tools quickly estimate typical energy savings and calculate corresponding incentives. Standardized incentives include, but are not limited to, lighting and HVAC measures.

Incentives are limited to 50 percent of the incremental equipment costs, up to $20,000 per year per account number. Kentucky Power may revise the payback range and/or the maximum incentive per project based upon program implementation contractor recommendations and/or overall customer response to the program.

Implementation Strategy

Kentucky Power should engage a third-party implementation contractor to:

- Process customer applications, verify customer and project eligibility and process rebates. Ensure baselines are administered with all standards governing customer equipment performance including acceptable illumination levels and HVAC ASHRAE 90.1
- Conduct QA/QC.
- Provide customer service support.
- Track program performance. Validate program savings with on-site inspection and measurement. Provide modeling as applicable to interface with customer design team.
- Proactive interaction with customer design team/engineers.
- Periodically report progress towards program goals and opportunities for improvement.
- Develop program projection based on realistic market and economic variables.
- Market program to achieve program targets.

Key pillars of the marketing strategy include builders and direct customer marketing, including direct mail, email blasts and HVAC trade publications. Additional marketing tactics include:

- Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KPCO should coordinate with specific associations to highlight suitable program offerings.

- Highlight successfully completed projects. KPCO should select projects to display the process and benefits of the program. This type of marketing often spurs the customer's competitors to improve building performance and increase business process efficiency.

Risk Management

The key barriers are return on investment, decision timing and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough builders are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.

Change from Current Program

The proposed program design separates New Construction from the Commercial Incentive program.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions.

Whole Building Design Approach Incentives

Performance Exceeding ASHRAE 90.1-2007	Incentive
≥10 and <20% more efficient than ASHRAE baseline building	$0.08 per kWh
≥20 and <30% more efficient than ASHRAE baseline building	$0.10 per kWh
≥30% more efficient than ASHRAE baseline building	$0.12 per kWh

Systems Approach Incentives

Equipment	Incentive
Lighting Power Density	$0.08 per kWh
Unitary and Split Air Conditioning and Air Source Heat Pump Systems	$40 per ton
Water and Air Cooled Chillers	$30 per ton
Hotel Guest Room Occupancy Sensor	$65 per unit

Estimated Participation

New Construction - Estimated Participation

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	8	8	8	8	8	8	8	8	8	8
Mid Scenario	8	8	8	8	8	8	8	8	8	8
High Scenario	8	8	8	8	8	8	8	8	8	8

Projected Energy & Demand Savings

New Construction - Projected Net Savings per Project

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
per Project	27,111	7.130	4.48

New Construction - Incremental Net Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	217	217	217	217	217	217	217	217	217	217
Mid Scenario	217	217	217	217	217	217	217	217	217	217
High Scenario	217	217	217	217	217	217	217	217	217	217

New Construction - Incremental Net Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
Mid Scenario	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
High Scenario	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0

New Construction - Incremental Net Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
Mid Scenario	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
High Scenario	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8

Projected Gross Energy & Demand Savings

New Construction - Projected Gross Savings per Project

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
per Project	32,482	8.542	5.364

New Construction - Incremental Gross Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	260	260	260	260	260	260	260	260	260	260
Mid Scenario	260	260	260	260	260	260	260	260	260	260
High Scenario	260	260	260	260	260	260	260	260	260	260

New Construction - Incremental Gross Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Mid Scenario	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
High Scenario	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3

New Construction - Incremental Gross Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Low Scenario	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
Mid Scenario	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
High Scenario	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9

Estimated Annual Program Budget

New Construction - Estimated Annual Budget, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351
Delivery	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533
Marketing	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$3,543	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981
Total	**$74,413**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**

New Construction - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351
Delivery	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533
Marketing	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$3,543	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981
Total	**$74,413**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**

New Construction - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351	$17,351
Delivery	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533	$32,533
Marketing	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986	$5,986
IT Reporting	$15,000	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Evaluation	$3,543	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981	$2,981
Total	**$74,413**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**	**$62,601**

Cost-Effectiveness

New Construction - Cost-Effectiveness, Low Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.24	1.41	1.44	1.46	1.48	1.50	1.52	1.53	1.54	1.55
RIM Test	0.61	0.65	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.61
Utility Cost Test	2.02	2.46	2.51	2.55	2.59	2.62	2.66	2.68	2.69	2.71
Participant Cost Test	5.45	5.59	5.73	5.87	6.02	6.16	6.32	6.48	6.64	6.80

New Construction - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.24	1.41	1.44	1.46	1.48	1.50	1.52	1.53	1.54	1.55
RIM Test	0.61	0.65	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.61
Utility Cost Test	2.02	2.46	2.51	2.55	2.59	2.62	2.66	2.68	2.69	2.71
Participant Cost Test	5.45	5.59	5.73	5.87	6.02	6.16	6.32	6.48	6.64	6.80

New Construction - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.24	1.41	1.44	1.46	1.48	1.50	1.52	1.53	1.54	1.55
RIM Test	0.61	0.65	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.61
Utility Cost Test	2.02	2.46	2.51	2.55	2.59	2.62	2.66	2.68	2.69	2.71
Participant Cost Test	5.45	5.59	5.73	5.87	6.02	6.16	6.32	6.48	6.64	6.80

School Energy Management

Provide energy management services to eligible school districts located within Kentucky Power's service territory.

Target Market

Energy management professionals and eligible school districts.

Program Description

The program is a partnership between Kentucky Power and the Kentucky School Boards Association (KSBA) to support the School Energy Managers Project to maintain a major presence within schools in eastern Kentucky. The project employs school energy manager(s) to work with eligible school districts to identify behavioral changes and better utilize automation equipment to improve energy efficiency.

School energy managers benefit from continuity of employment, technical training and improved skills.

Implementation Strategy

Kentucky Power will continue to work with the KSBA to manage and implement the program. The Kentucky School Boards Association is responsible for hiring the school energy manager(s) and ensuring their performance is meeting program standards.

School energy manager responsibilities include:

- Outreach and education to eligible school districts.
- Engage school districts to take steps to improve energy efficiency through behavioral changes, purchase and installation of efficient equipment and better utilization of automation equipment.
- Track program performance.
- Provide reports on program operations and energy savings achieved.

Risk Management

One potential risk is that Kentucky Power doesn't have authority over KSBA's management of the program. Kentucky Power relies on KSBA to select a qualified school energy manager(s) and implement the program with eligible school districts. One solution is for Kentucky Power to meet with school energy manager(s) and/or KSBA on a semi-annual basis to stay engaged and involved in the program process. Potential discussions include program operations, energy savings achievements, and program goals.

Another potential risk is a limited supply of qualified individuals with the skills to be employed as a school energy manager. A long-term solution is the development of a local network of qualified professionals. The KSBA and Kentucky Power can work with local technical schools and colleges/universities to offer training courses to help develop a local network of qualified professionals.

Change from Current Program

n/a

Measures & Incentives

There are no monetary incentives, funds for this program are utilized for energy manager labor and/or installed energy conservation measures.

Estimated Participation

School Energy Manager - Estimated Participation (Number of School Districts)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	20	20	20	20	20	20	20	20	20	20
High Scenario	22	22	22	22	22	22	22	22	22	22

Projected Net Energy & Demand Savings[17]

School Energy Manager - Projected Net Savings per School

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
per School District	27,910	10.060	10.060

School Energy Manager - Incremental Net Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	588	588	588	588	588	588	588	588	588	588
High Scenario	614	614	614	614	614	614	614	614	614	614

School Energy Manager - Incremental Net Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2
High Scenario	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3

School Energy Manager - Incremental Net Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2
High Scenario	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3

Projected Gross Energy & Demand Savings

School Energy Manager - Projected Gross Savings per School

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
per School District	27,910	10.060	10.060

School Energy Manager - Incremental Gross Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	588	588	588	588	588	588	588	588	588	588
High Scenario	614	614	614	614	614	614	614	614	614	614

School Energy Manager - Incremental Gross Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2
High Scenario	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3

School Energy Manager - Incremental Gross Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2	201.2
High Scenario	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3

[17] Note: The program school year represented with the summary results is based on a July 1 – June 30 reporting period.

Estimated Annual Program Budget

School Energy Manager - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
IT Reporting	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Evaluation	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750
Total	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**

School Energy Manager - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Delivery	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
IT Reporting	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Evaluation	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750	$10,750
Total	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**	**$225,750**

Cost-Effectiveness

School Energy Manager - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.01	1.05	1.09	1.11	1.13	1.16	1.18	1.18	1.19	1.19
RIM Test	0.58	0.59	0.60	0.60	0.61	0.61	0.61	0.60	0.60	0.59
Utility Cost Test	1.41	1.47	1.52	1.55	1.59	1.62	1.65	1.66	1.67	1.67
Participant Cost Test	5.95	6.10	6.26	6.42	6.59	6.76	6.94	7.12	7.30	7.49

School Energy Manager - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.08	1.12	1.16	1.19	1.21	1.24	1.26	1.27	1.27	1.28
RIM Test	0.60	0.61	0.62	0.63	0.63	0.63	0.63	0.62	0.62	0.61
Utility Cost Test	1.55	1.62	1.67	1.71	1.74	1.78	1.81	1.82	1.83	1.84
Participant Cost Test	5.95	6.10	6.26	6.42	6.59	6.76	6.94	7.12	7.30	7.49

Bid for Efficiency

Encourage high-volume energy savings projects from customers and third-party suppliers working on behalf of commercial customers at a lower cost than traditional programs. This program provides an opportunity to organize and procure non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs.

Target Market

Any commercial customer as well as third-party suppliers, such as energy service companies, dealers and performance contractors.

Program Description

The program seeks to purchase blocks of electric savings through a competitive bidding process. Kentucky Power issues a Request for Qualifications (RFQ) to eligible customers and third-party suppliers to select pre-qualified participants. The RFQ details the program requirements as well as the electric savings to be achieved. Customers and/or third parties submit their qualifications as well as describe the proposed energy efficiency project(s) and implementation strategy.

The responses are reviewed to:

- Verify customer eligibility and ability to implement energy efficiency projects within the program requirements.
- Ensure completeness and accuracy of the proposed energy efficiency projects and implementation strategy.
- Screen the proposed projects for cost-effectiveness. All projects must have a Total Resource Cost Test benefit-cost ratio of greater than 1.0.

Pre-qualified participants are then eligible to participate in a live bid process. The bid process, known as a reverse bid, starts at an established ceiling price ($/kWh saved). The pre-qualified participants bid down the price to a level at which they will complete their proposed energy efficiency project(s).

The winning participant(s) complete the project(s) based upon the awarded $/kWh. All projects must receive pre- and post-implementation inspections to verify the existing and upgraded equipment. The acquired savings may differ from the expected savings stated in the contract based upon actual performance and the post-implementation inspection.

Customers have up to 12 months from project bid award to complete the requirements of the program including submittal of all project completion forms and validation of project savings.

Implementation Strategy

Kentucky Power should administer the program with assistance from a third-party implementation contractor. Implementation contractor activities include:

- Assist with outreach and education to potential bidders.
- Review bidder RFQs and pre-qualify participants.
- Develop and oversee the live bid process.
- Provide customer service support.
- Develop quality assurance/quality control (QA/QC) procedures and perform pre- and post-implementation inspections.
- Track program performance. Validate project savings using accepted International Performance Measurement and Verification Protocols (IPMVP).
- Periodically report progress towards program goals and identify opportunities for improvement.

Marketing should be targeted to third-party suppliers and customers. Tactics may include:

- Training sessions and/or instructional videos to educate third-party suppliers and customers on the program. Additional training and educational sessions as needed (e.g., mock live auction).
- Direct outreach via key account representatives, news releases, announcements, telephone calls and email.
- Highlight successfully completed projects to display the benefits of the program.
- Third-party suppliers promote the program directly to eligible customers via social media, email, direct contact, and other available media options.
- Training and instructional videos by implementation contractor specific to Kentucky Power program. Other opportunities for customer instruction may occur including a mock bid process.

Risk Management

The most challenging aspect is engaging customers and the ability of customers to achieve the required block of savings. The implementation contractor and KPCO staff must work closely to ensure potential bidders understand the program requirements and work to correct any issues or concerns that arise in bidder projects. Customers must be made aware of the ability to bundle projects and/or work with a third-party supplier to achieve the required block of energy savings. The implementation contractor and KPCO staff must work closely with the winning participant(s) to ensure projects are being completed in a timely fashion and issues are addressed in a timely fashion.

Change from Current Program

n/a

Measures & Incentives

Incentives of $0.08 per first-year-kWh saved were assumed for planning purposes, but the actual incentive payments will be a result of the live bid process. Program management can choose the threshold cost below which they are willing to pay based on the condition of budgets and energy and peak demand savings goals at the time the bids are received.

Estimated Participation[18]

The program is not offered in the Low Scenario.

Bid for Efficiency - Estimated Participation

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	1	1	1	1	1	1	1	1	1
High Scenario	0	1	1	1	1	1	1	1	1	1

Projected Net Energy & Demand Savings

Bid for Efficiency - Projected Net Savings per RFP

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
per RFP	2,318,765	264.7	264.7

[18] Participation in this context relates to the number of RFQs that will take place in that year.

Bid for Efficiency - Incremental Net Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
High Scenario	0	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319

Bid for Efficiency - Incremental Net Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7
High Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7

Bid for Efficiency - Incremental Net Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7
High Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7

Projected Gross Energy & Demand Savings

Bid for Efficiency - Projected Gross Savings per RFP

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
per RFP	2,318,765	264.7	264.7

Bid for Efficiency - Incremental Gross Energy Savings (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319
High Scenario	0	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319	2,319

Bid for Efficiency - Incremental Gross Summer Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7
High Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7

Bid for Efficiency - Incremental Gross Winter Peak Savings (kW)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Mid Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7
High Scenario	0	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7	264.7

Estimated Annual Program Budget

Bid for Efficiency - Estimated Annual Budget, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$0	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501
Delivery	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877
Marketing	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390
IT Reporting	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Evaluation	$14,463	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738
Total	**$303,730**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**

Bid for Efficiency - Estimated Annual Budget, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$0	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501	$185,501
Delivery	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877	$231,877
Marketing	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390	$33,390
IT Reporting	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Evaluation	$14,463	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738	$23,738
Total	**$303,730**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**	**$498,506**

Cost-Effectiveness

Bid for Efficiency - Cost-Effectiveness, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	-	2.76	2.81	2.86	2.91	2.96	3.00	3.00	3.01	3.00
RIM Test	-	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.54	0.52
Utility Cost Test	-	2.16	2.20	2.24	2.27	2.31	2.34	2.35	2.35	2.35
Participant Cost Test	n/a	32.18	32.96	33.75	34.56	35.40	36.26	37.14	38.04	38.97

Bid for Efficiency - Cost-Effectiveness, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	-	2.76	2.81	2.86	2.91	2.96	3.00	3.00	3.01	3.00
RIM Test	-	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.54	0.52
Utility Cost Test	-	2.16	2.20	2.24	2.27	2.31	2.34	2.35	2.35	2.35
Participant Cost Test	n/a	32.18	32.96	33.75	34.56	35.40	36.26	37.14	38.04	38.97

Retro-Commissioning

Encourage commercial and industrial customers to optimize their facility systems and reduce energy consumption.

Target Market

All commercial and industrial customers that pay into the Demand Side Mechanism and qualifying contractors to perform the studies.

Program Description

The program provides a study to optimize customer's building automation systems. Eligible customers receive one of the following fully funded studies depending upon their building size:

- RCx Lite: Buildings with 50,000 and 150,000 square feet and 150 < 500 kW peak demand. A program affiliated dealer completes a targeted assessment and recommend improvements. Customers agree to spend a minimum of $5,000 towards improvements with ≤18 month payback identified through the study.
- RCx Standard: Facilities larger than 150,000 square feet and with ≥500 kW peak demand receives a comprehensive study and a verification report with pre- and post-results. Customers agree to spend a minimum of $15,000 towards improvements with ≤18 month payback identified through the study.

To qualify for the program, customers must pay into the DSIM and meet the minimum building sizes outlined above.

Implementation Strategy

Kentucky Power should engage a third-party implementation contractor to:

- Process customer applications, verify customer eligibility and process rebates.
- Establish relationships with local dealers to work with the program.
- Maintain qualified list of certified retro-commissioning contractors and maintain quality control of qualified list.
- Track program performance, including customer and dealer participation as well as verification of reported savings and measure installation.
- Develop quality assurance/quality control (QA/QC) procedures and conduct random inspections of projects.
- Provide customer service support.
- Periodically report progress towards program goals and opportunities for improvement.
- Provide documented validation of reported savings. Ability to track measures associated with reported savings.
- Conduct inspections as required and/or recommended to validate savings.
- Market program to customers, trade organizations, etc. as required to meet project participation and savings targets. Develop and maintain comprehensive program marketing plan with focused outreach to target markets.

Key pillars of the marketing strategy include dealers and direct customer marketing, including direct mail, email blasts, Kentucky Power key account representatives and HVAC trade publications. Additional marketing tactics may include:

- Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KPCO should coordinate with specific associations to highlight suitable program offerings.

- Highlight successfully completed projects. KPCO should select projects to display the process and benefits of the program. This type of marketing typically spurs the customer's competitors to improve building performance and increase business process efficiency.

Risk Management

The key barriers are return on investment, decision timing and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough service providers are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.

Change from Current Program

n/a

Measures & Incentives

Incentives are set at $0.12 per first year kWh saved for RCx Lite participants and $0.08 per first year kWh saved for RCx Standard participants. Rebates per year are limited to $100,000 per customer.

Estimated Participation

Retro-Commissioning - Estimated Participation, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	5	5	5	6	6	6	8	8	8	8
Commercial RCx Standard	-	-	-	-	-	-	-	-	-	-

Retro-Commissioning - Estimated Participation, High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	7	8	9	9	9	9	9	9	9	9
Commercial RCx Standard	1	1	1	1	1	1	1	1	1	1
Industrial RCx Lite	2	2	2	2	2	2	2	2	2	2

Projected Net Energy & Demand Savings

Retro-Commissioning - Projected Net Savings per Participant

Unit	Net kWh Savings per Unit	Net Summer Peak kW Savings per Unit	Net Winter Peak kW Savings per Unit
Commercial RCx Lite	138,804	17.4	17.4
Commercial RCx Standard	810,867	101.7	101.7
Industrial RCx Lite	73,935	9.3	9.3

Retro-Commissioning - Incremental Net Savings, Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Net Energy Savings (MWh)	694	694	694	833	833	833	1,110	1,110	1,110	1,110
Net Summer Peak Savings (MW)	87.0	87.0	87.0	104.4	104.4	104.4	139.2	139.2	139.2	139.2
Net Winter Peak Savings (MW)	87.0	87.0	87.0	104.4	104.4	104.4	139.2	139.2	139.2	139.2

Retro-Commissioning - Incremental Net Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	972	1,110	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249
Commercial RCx Standard	811	811	811	811	811	811	811	811	811	811
Industrial RCx Lite	148	148	148	148	148	148	148	148	148	148

Retro-Commissioning - Incremental Net Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	121.8	139.2	156.6	156.6	156.6	156.6	156.6	156.6	156.6	156.6
Commercial RCx Standard	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7
Industrial RCx Lite	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5

Retro-Commissioning - Incremental Net Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	121.8	139.2	156.6	156.6	156.6	156.6	156.6	156.6	156.6	156.6
Commercial RCx Standard	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7
Industrial RCx Lite	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5

Projected Gross Energy & Demand Savings

Retro-Commissioning - Projected Gross Savings per Participant

Unit	Gross kWh Savings per Unit	Gross Summer Peak kW Savings per Unit	Gross Winter Peak kW Savings per Unit
Commercial RCx Lite	166,304	20.8	20.8
Commercial RCx Standard	971,515	121.8	121.8
Industrial RCx Lite	88,583	11.1	11.1

Retro-Commissioning - Incremental Gross Energy Savings (MWh), Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gross Energy Savings (MWh)	832	832	832	998	998	998	1,330	1,330	1,330	1,330
Gross Summer Peak Savings (MW)	104.2	104.2	104.2	125.1	125.1	125.1	166.8	166.8	166.8	166.8
Gross Winter Peak Savings (MW)	104.2	104.2	104.2	125.1	125.1	125.1	166.8	166.8	166.8	166.8

Retro-Commissioning - Incremental Gross Energy Savings (MWh), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	1,164	1,330	1,497	1,497	1,497	1,497	1,497	1,497	1,497	1,497
Commercial RCx Standard	972	972	972	972	972	972	972	972	972	972
Industrial RCx Lite	177	177	177	177	177	177	177	177	177	177

Retro-Commissioning - Incremental Gross Summer Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	145.9	166.8	187.6	187.6	187.6	187.6	187.6	187.6	187.6	187.6
Commercial RCx Standard	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8
Industrial RCx Lite	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2

Retro-Commissioning - Incremental Gross Winter Peak Savings (kW), High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Commercial RCx Lite	145.9	166.8	187.6	187.6	187.6	187.6	187.6	187.6	187.6	187.6
Commercial RCx Standard	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8
Industrial RCx Lite	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2

Estimated Annual Program Budget

Retro-Commissioning - Estimated Annual Budget, Commercial Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$83,283	$83,283	$83,283	$99,939	$99,939	$99,939	$133,252	$133,252	$133,252	$133,252
Delivery	$111,043	$111,043	$111,043	$133,252	$133,252	$133,252	$177,670	$177,670	$177,670	$177,670
Marketing	$9,716	$9,716	$9,716	$11,660	$11,660	$11,660	$15,546	$15,546	$15,546	$15,546
IT Reporting	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
Evaluation	$10,502	$10,502	$10,502	$12,543	$12,543	$12,543	$16,623	$16,623	$16,623	$16,623
Total	**$220,545**	**$220,545**	**$220,545**	**$263,393**	**$263,393**	**$263,393**	**$349,091**	**$349,091**	**$349,091**	**$349,091**

Retro-Commissioning - Estimated Annual Budget, Commercial High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$181,465	$198,122	$214,778	$214,778	$214,778	$214,778	$214,778	$214,778	$214,778	$214,778
Delivery	$285,200	$307,408	$329,617	$329,617	$329,617	$329,617	$329,617	$329,617	$329,617	$329,617
Marketing	$23,333	$25,276	$27,220	$27,220	$27,220	$27,220	$27,220	$27,220	$27,220	$27,220
IT Reporting	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
Evaluation	$24,800	$26,840	$28,881	$28,881	$28,881	$28,881	$28,881	$28,881	$28,881	$28,881
Total	**$520,798**	**$563,647**	**$606,496**	**$606,496**	**$606,496**	**$606,496**	**$606,496**	**$606,496**	**$606,496**	**$606,496**

Retro-Commissioning - Estimated Annual Budget, Industrial High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Incentives	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744
Delivery	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744	$17,744
Marketing	$1,774	$1,774	$1,774	$1,774	$1,774	$1,774	$1,774	$1,774	$1,774	$1,774
IT Reporting	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Evaluation	$1,863	$1,863	$1,863	$1,863	$1,863	$1,863	$1,863	$1,863	$1,863	$1,863
Total	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**	**$39,126**

Cost-Effectiveness

Retro-Commissioning - Cost-Effectiveness, Commercial Mid Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.13	1.16	1.19	1.24	1.27	1.31	1.35	1.36	1.36	1.37
RIM Test	0.40	0.40	0.41	0.41	0.42	0.43	0.43	0.43	0.42	0.42
Utility Cost Test	0.81	0.83	0.86	0.88	0.91	0.94	0.97	0.97	0.97	0.98
Participant Cost Test	25.57	26.14	26.71	27.30	27.91	28.53	29.17	29.82	30.49	31.18

Retro-Commissioning - Cost-Effectiveness, Commercial High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.23	1.25	1.29	1.32	1.36	1.40	1.44	1.44	1.45	1.45
RIM Test	0.41	0.42	0.42	0.43	0.43	0.44	0.44	0.44	0.44	0.43
Utility Cost Test	0.88	0.90	0.92	0.95	0.98	1.01	1.03	1.04	1.04	1.04
Participant Cost Test	37.72	37.26	37.02	37.85	38.71	39.58	40.49	41.41	42.36	43.34

Retro-Commissioning - Cost-Effectiveness, Industrial High Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
TRC Test	1.28	1.31	1.35	1.39	1.43	1.47	1.51	1.52	1.52	1.53
RIM Test	0.43	0.44	0.44	0.45	0.46	0.46	0.47	0.46	0.45	0.45
Utility Cost Test	0.97	1.00	1.03	1.06	1.09	1.12	1.15	1.15	1.16	1.16
Participant Cost Test	8.8	8.9	9.1	9.3	9.5	9.7	9.9	10.1	10.3	10.6

SECTION | APPENDIX A

Kentucky Power Cost-Effectiveness Inputs

Kentucky Power General Inputs

Inflation Rate	2.24%
Discount Rate	8.08%
Energy Line Loss	5.66%
Peak Line Loss	7.06%
Environmental Externality ($/kWh)	$0.0114

Kentucky Power Avoided Energy and Capacity Costs

	Avoided Energy ($/kWh)	Avoided Capacity ($/kW)
2016	$0.05	$30
2017	$0.05	$41
2018	$0.05	$61
2019	$0.05	$65
2020	$0.05	$68
2021	$0.05	$71
2022	$0.06	$74
2023	$0.06	$78
2024	$0.06	$81
2025	$0.06	$84
2026	$0.06	$88
2027	$0.06	$91
2028	$0.06	$91
2029	$0.06	$91
2030	$0.06	$91
2031	$0.06	$91
2032	$0.06	$91
2033	$0.06	$91
2034	$0.05	$91

Kentucky Power Electric Retail Rate ($/kWh)

	Residential	Commercial	Industrial
2016	$0.115	$0.120	$0.069
2017	$0.118	$0.123	$0.071
2018	$0.121	$0.126	$0.073
2019	$0.124	$0.129	$0.075
2020	$0.128	$0.133	$0.077
2021	$0.131	$0.136	$0.079
2022	$0.135	$0.140	$0.081
2023	$0.138	$0.143	$0.083
2024	$0.142	$0.147	$0.086
2025	$0.146	$0.151	$0.088
2026	$0.150	$0.155	$0.090
2027	$0.154	$0.159	$0.093
2028	$0.158	$0.163	$0.095
2029	$0.163	$0.167	$0.098
2030	$0.167	$0.172	$0.100
2031	$0.172	$0.176	$0.103
2032	$0.176	$0.181	$0.106
2033	$0.181	$0.185	$0.109
2034	$0.19	$0.19	$0.11
2035	$0.19	$0.20	$0.11
2036	$0.20	$0.20	$0.12
2037	$0.20	$0.21	$0.12
2038	$0.21	$0.21	$0.12
2039	$0.21	$0.22	$0.13
2040	$0.22	$0.22	$0.13
2041	$0.22	$0.23	$0.13
2042	$0.23	$0.23	$0.14
2043	$0.24	$0.24	$0.14
2044	$0.24	$0.25	$0.15

SECTION | APPENDIX B

Energy Efficiency Measure Screening

The measures screened for inclusion in the DSM Program Plan are listed in the table below.

	Efficient Description	Base Description
Res	Standard CFL	Halogen Bulb
Res	Specialty CFL	Incandescent Bulb
Res	LED	Halogen
Res	Specialty LED	Incandescent Bulb
Res	Exterior CFL	Halogen Bulb
Res	ENERGY STAR Ceiling Fan	Standard Ceiling Fan
Res	ENERGY STAR Dehumidifier	Standard Dehumidifier
Res	ENERGY STAR Air Purifier	Standard Air Purifier
Res	ENERGY STAR Clothes Washer	Standard Clothes Washer
Res	ENERGY STAR Clothes Dryer	Standard Clothes Dryer
Res	Heat Pump Clothes Dryer	Standard Clothes Dryer
Res	ENERGY STAR Refrigerator	Standard Refrigerator
Res	CEE Tier 2 Refrigerator	Standard Refrigerator
Res	ENERGY STAR Freezer	Standard Freezer
Res	ENERGY STAR Dishwasher	Standard Dishwasher
Res	ENERGY STAR Room Air Conditioner	Standard Room Air Conditioner
Res	Smart Power Strip	Standard Power Strip
Res	Refrigerator Recycle	No Recycle
Res	Freezer Recycle	No Recycle
Res	Room A/C Recycle	No Recycle
Res	Pipe Insulated (Electric DHW)	No Pipe Insulation
Res	Pipe Insulated (Natural Gas DHW)	No Pipe Insulation
Res	Water Heater Temperature Setback (Electric DHW)	No Water Heater Setback
Res	Water Heater Temperature Setback (Natural Gas DHW)	No Water Heater Setback
Res	Water Heater Tank Wrap (Electric DHW)	No Tank Wrap
Res	Low Flow Faucet Aerator - Single Family (Electric DHW)	Standard Faucet Aerator
Res	Low Flow Faucet Aerator - Single Family (Natural Gas DHW)	Standard Faucet Aerator
Res	Low Flow Faucet Aerator - Multi-Family (Electric DHW)	Standard Faucet Aerator
Res	Low Flow Faucet Aerator - Multi-Family (Natural Gas DHW)	Standard Faucet Aerator
Res	Low Flow Showerhead - Single Family (Electric DHW)	Standard Showerhead
Res	Low Flow Showerhead - Single Family (Natural Gas DHW)	Standard Showerhead
Res	Low Flow Showerhead - Multi-Family (Electric DHW)	Standard Showerhead
Res	Low Flow Showerhead - Multi-Family (Natural Gas DHW)	Standard Showerhead
Res	Heat Pump Water Heater (Electric Heat)	Standard Water Heater
Res	Heat Pump Water Heater (Natural Gas Heat)	Standard Water Heater
Res	Weatherstrip/Caulk (ASHP)	No Weatherstrip/Caulk
Res	Weatherstrip/Caulk (CAC Electric Heat)	No Weatherstrip/Caulk
Res	Weatherstrip/Caulk (CAC/Gas Heat)	No Weatherstrip/Caulk
Res	Door Sweep (ASHP)	No Weatherstrip/Caulk
Res	Door Sweep (CAC/Electric Heat)	No Weatherstrip/Caulk
Res	Door Sweep (CAC/Gas Heat)	No Weatherstrip/Caulk
Res	Foam (ASHP)	No Foam
Res	Foam (CAC/Electric Heat)	No Foam
Res	Foam (CAC/Gas Heat)	No Foam
Res	Duct Sealing - Tape (ASHP)	No Duct Sealing
Res	Duct Sealing - Tape (CAC/Electric Heat)	No Duct Sealing
Res	Duct Sealing - Tape (CAC/Gas Heat)	No Duct Sealing
Res	Duct Sealing 10% (ASHP)	No Duct Sealing

	Efficient Description	Base Description
Res	Duct Sealing 10% (CAC/Electric Heat)	No Duct Sealing
Res	Duct Sealing 10% (CAC/Gas Heat)	No Duct Sealing
Res	Air Sealing 20% ACH Reduction (ASHP)	No Air Sealing
Res	Air Sealing 20% ACH Reduction (CAC/Electric Heat)	No Air Sealing
Res	Air Sealing 20% ACH Reduction (CAC/Gas Heat)	No Air Sealing
Res	Air Sealing 30% ACH Reduction (ASHP)	No Air Sealing
Res	Air Sealing 30% ACH Reduction (CAC/Electric Heat)	No Air Sealing
Res	Air Sealing 30% ACH Reduction (CAC/Gas Heat)	No Air Sealing
Res	Attic Insulation R-38 (ASHP)	No Attic Insulation
Res	Attic Insulation R-38 (CAC/Electric Heat)	No Attic Insulation
Res	Attic Insulation R-38 (CAC/Gas Heat)	No Attic Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-38 (ASHP)	No Air Sealing/Base Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-38 (CAC/Electric Heat)	No Air Sealing/Base Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-38 (CAC/Gas Heat)	No Air Sealing/Base Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-49 (ASHP)	No Air Sealing/Base Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-49 (CAC/Electric Heat)	No Air Sealing/Base Insulation
Res	Air Sealing 20% ACH Reduction & Attic Insulation R-49 (CAC/Gas Heat)	No Air Sealing/Base Insulation
Res	Attic Insulation R-38 (ASHP)	Base Insulation
Res	Attic Insulation R-38 (CAC/Electric Heat)	Base Insulation
Res	Attic Insulation R-38 (CAC/Gas Heat)	Base Insulation
Res	Attic Insulation R-49 (ASHP)	Base Insulation
Res	Attic Insulation R-49 (CAC/Electric Heat)	Base Insulation
Res	Attic Insulation R-49 (CAC/Gas Heat)	Base Insulation
Res	Wall Insulation R-13 (ASHP)	Base Insulation
Res	Wall Insulation R-13 (CAC/Electric Heat)	Base Insulation
Res	Wall Insulation R-13 (CAC/Gas Heat)	Base Insulation
Res	Basement Sidewall Insulation R-13 (ASHP)	Base Insulation
Res	Basement Sidewall Insulation R-13 (CAC/Electric Heat)	Base Insulation
Res	Basement Sidewall Insulation R-13 (CAC/Gas Heat)	Base Insulation
Res	Crawlspace Insulation R-19 (ASHP)	Base Insulation
Res	Crawlspace Insulation R-19 (CAC/Electric Heat)	Base Insulation
Res	Crawlspace Insulation R-19 (CAC/Gas Heat)	Base Insulation
Res	Efficient Door (SF)	Standard Doors
Res	Efficient Door (MF)	Standard Doors
Res	Efficient Window (SF)	Standard Window
Res	Efficient Window (MF)	Standard Window
Res	Furnace Blower Motor	No Furnace Fan
Res	Heat Pump Ductless Mini Split Replace ASHP	Existing Heat Pump
Res	Heat Pump Ductless Mini Split Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Heat Pump Ductless Mini Split Replace Resistance Heat/RAC	Resistance Heat & RAC
Res	Heat Pump Ductless Mini Split Replace Resistance Heat	Resistance Heat & no Cooling
Res	Central Air Conditioner Tune-Up	No Tune-Up
Res	Heat Pump Tune-Up	No Tune-Up
Res	Efficient Heat Pump (SEER 15, EER 12.5, HSPF 8.5)	Standard SEER 14 Heat Pump
Res	Efficient Heat Pump (SEER 16, EER 13, HSPF 9)	Standard SEER 14 Heat Pump
Res	Efficient Heat Pump (SEER 18, EER 13, HSPF 10)	Standard SEER 14 Heat Pump
Res	Efficient Heat Pump SEER 14 Replace Resistance Heat	Resistance Heat & no Cooling
Res	Efficient Heat Pump SEER 15 Replace Resistance Heat	Resistance Heat & no Cooling
Res	Efficient Heat Pump SEER 16 Replace Resistance Heat	Resistance Heat & no Cooling
Res	Efficient Heat Pump SEER 18 Replace Resistance Heat	Resistance Heat & no Cooling
Res	Efficient Heat Pump SEER 14 Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Efficient Heat Pump SEER 15 Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Efficient Heat Pump SEER 16 Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Efficient Heat Pump SEER 18 Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Efficient Air Conditioner (SEER 15, EER 12.5)	Standard SEER 14 CAC
Res	Efficient Air Conditioner (SEER 16, EER 13)	Standard SEER 14 CAC
Res	Efficient Air Conditioner (SEER 18, EER 13)	Standard SEER 14 CAC

	Efficient Description	Base Description
Res	Geothermal Heat Pump Replace ASHP	Standard SEER 14 Heat Pump
Res	Geothermal Heat Pump Replace CAC	Standard SEER 14 CAC
Res	Geothermal Heat Pump Replace Resistance Heat w/CAC	Resistance Heat & CAC
Res	Geothermal Heat Pump Replace Resistance Heat no CAC	Resistance Heat & no Cooling
Res	Smart Programmable Thermostat (CAC)	Manual thermostat
Res	Smart Programmable Thermostat (CAC)	Programmable thermostat
Res	Smart Programmable Thermostat (ASHP)	Manual thermostat
Res	Smart Programmable Thermostat (ASHP)	Programmable thermostat
Res	Energy Star Manufactured Home	Standard Manufactured Home
Res	Eco-Rated Manufactured Home	Standard Manufactured Home
Non-Res	CFL	Halogen
Non-Res	Lighting Optimization - Remove 4ft Lamp from T8 System	
Non-Res	Lighting Optimization - Remove 8ft Lamp from T8 System	
Non-Res	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	250W Metal Halide
Non-Res	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	400W Metal Halide
Non-Res	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	250W Metal Halide
Non-Res	High Bay Fluorescent Fixture (HP T8 >4 lamps)	400W Metal Halide
Non-Res	Re-lamp T12 to High Performance T8 (≤4 lamps)	Standard T12
Non-Res	Re-lamp T8 to High Performance T8 (≤4 lamps)	Standard T8
Non-Res	Low Wattage T8 Lamp	Standard T8
Non-Res	High Performance T8 Lamp	Standard T8
Non-Res	Omnidirectional LED Bulb (<10W)	Halogen/CFL (2020)
Non-Res	Omnidirectional LED Bulb (≥10W)	Halogen
Non-Res	Directional LED Bulb (<15W)	Incandescent
Non-Res	Directional LED Bulb (≥15W)	Incandescent
Non-Res	LED Refrigerator Case Light (per foot)	Standard Fluorescent
Non-Res	LED Recessed Fixture (1ft x 4ft)	T8
Non-Res	LED Recessed Fixture (2ft x 2ft)	T8 U-tube
Non-Res	LED Recessed Fixture (2ft x 4ft)	T8
Non-Res	LED High & Low-Bay Fixture	Pulse Start MH
Non-Res	LED Wall Mounted Area Lights (<30W)	100W Metal Halide
Non-Res	LED Wall Mounted Area Lights (30-75W)	175W Metal Halide
Non-Res	LED Wall Mounted Area Lights (≥75W)	250W Metal Halide
Non-Res	LED Flood Light (<15W)	Metal Halide
Non-Res	LED Flood Light (≥15W)	Metal Halide
Non-Res	LED Exit Sign	Standard Fluorescent
Non-Res	Photocell Occupancy Sensor	No Control
Non-Res	Wall-Mount Occupancy Sensor	No Control
Non-Res	Ceiling-Mount Occupancy Sensor	No Control
Non-Res	Air Cooled Chiller (<150 Tons)	Standard Chiller
Non-Res	Air Cooled Chiller (≥150 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Rotary Screw & Roll (<75 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Rotary Screw & Roll (75 < 150 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Rotary Screw & Roll (150 < 300 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Rotary Screw & Roll (≥300 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Centrifugal (<300 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Centrifugal (300 < 600 Tons)	Standard Chiller
Non-Res	Water Cooled Chiller, Centrifugal (≥600 Tons)	Standard Chiller
Non-Res	Air Source Heat Pump (<65 kBtuh)	Standard Heat Pump
Non-Res	Air Source Heat Pump (65<135 kBtuh)	Standard Heat Pump
Non-Res	Air Source Heat Pump (135<240 kBtuh)	Standard Heat Pump
Non-Res	Air Source Heat Pump (≥240 kBtuh)	Standard Heat Pump
Non-Res	Water Source Heat Pump	Standard Heat Pump
Non-Res	Air Conditioner (<65 kBtuh)	Standard Air Conditioner
Non-Res	Air Conditioner (65<135 kBtuh)	Standard Air Conditioner
Non-Res	Air Conditioner (135<240 kBtuh)	Standard Air Conditioner
Non-Res	Air Conditioner (240<760 kBtuh)	Standard Air Conditioner

	Efficient Description	Base Description
Non-Res	Air Conditioner (≥760 kBtuh)	Standard Air Conditioner
Non-Res	ENERGY STAR Room Air Conditioner	Standard Room Air Conditioner
Non-Res	PTAC	Standard PTAC
Non-Res	PTHP	Standard PTHP
Non-Res	GREM PTAC & Electric Resistance Heat	No GREM
Non-Res	GREM PTAC & Gas Heating	No GREM
Non-Res	GREM PTHP	No GREM
Non-Res	GREM Central Hot Water Fan Coil & Electric Resistance Heat	No GREM
Non-Res	GREM Central Hot Water Fan Coil & Gas Heating	No GREM
Non-Res	Variable Speed Drives for HVAC Systems (HVAC Application)	No VSD on HVAC System
Non-Res	Variable Speed Drives for HVAC Systems (Pump Application)	No VSD on HVAC System
Non-Res	Demand Control Ventilation	No Demand Control Ventilation
Non-Res	Notched V-Belts for HVAC Systems	Standard V-Belt
Non-Res	Storage Water Heater	Standard Water Heater
Non-Res	Low Flow Faucet Aerator (Electric DHW)	Standard Faucet Aerator
Non-Res	Low Flow Faucet Aerator (Natural Gas DHW)	Standard Faucet Aerator
Non-Res	Low Flow Showerhead (Electric DHW)	Standard Showerhead
Non-Res	Low Flow Showerhead (Natural Gas DHW)	Standard Showerhead
Non-Res	Tankless Water Heater	Standard Water Heater
Non-Res	Automatic Door Closer for Walk-In Cooler	Standard Cooler
Non-Res	Automatic Door Closer for Walk-In Freezer	Standard Freezer
Non-Res	Beverage & Snack Machine Controls (Refrigerated)	Standard Machine
Non-Res	Beverage & Snack Machine Controls (Non-Refrigerated)	Standard Machine
Non-Res	Door Heater Controls - Cooler	Standard Door
Non-Res	Door Heater Controls - Freezer	Standard Door
Non-Res	ECM for Walk-In Cooler or Freezer	Standard Motor
Non-Res	Evaporator Fan Control	No Control
Non-Res	Strip Curtain for Walk-In Cooler	No Strip Curtain
Non-Res	Strip Curtain for Walk-In Freezer	No Strip Curtain
Non-Res	Night Cover for Open Refrigerator Display Cases	No Cover
Non-Res	ENERGY STAR Electric Steamer	Standard Steamer
Non-Res	ENERGY STAR Commercial Dishwasher	Standard Dishwasher
Non-Res	High Efficiency Pre-Rinse Spray Valve	Standard Spray Valve
Non-Res	ENERGY STAR Electric Fryer	Standard Fryer
Non-Res	Demand Control Ventilation	Standard Cooking Ventilation
Non-Res	No Air Loss Drain	Timed Drain

SECTION | **APPENDIX C**

Other Energy Efficiency Programs Considered

Additional programs were considered for inclusion in the Kentucky Power portfolio, but were not included in the final Plan. Programs were not included for a variety of reasons including cost-effectiveness, applicability to the Kentucky Power service territory, target market, ease of implementation, expected customer uptake, etc. The following programs were considered for inclusion in the Kentucky Power DSM Program Plan:

Student Energy Education. Continuation of the existing partnership with the National Energy Education Development Project (NEED) to offer free classroom instruction and educational materials to help 7th grade students learn about energy, electricity, the environment and economic issues.

Community Outreach CFL. Distribution of CFLs to customers at company-sponsored community events. Customers provided a copy of their Kentucky Power electric bill before they were provided the bulbs to ensure eligibility.

Building Code Compliance. Provide resources to local government officials to provide adequate training, education and/or staffing resources to improve building code compliance enforcement in residential and commercial new construction and major renovation projects.

Community Energy Efficiency. Partner with residents and businesses within targeted communities to encourage energy savings on a community level. The communities must demonstrate a commitment to energy efficiency and energy savings. Local activities and challenges can be used as tools to educate residents and businesses and encourage savings.

Self-Direct. Kentucky Power's largest commercial and industrial customers may receive incentives for energy efficiency measures installed within the past three to five years. These measures must be installed by the company and cannot receive an incentive through any other DSM Program.

Applied Energy Group, Inc.
317 George Street, Suite 305
New Brunswick, NJ 08901

P: 732.246.5700
F: 732.246.5775