



Ameren Missouri Residential Portfolio Evaluation Summary Program Year 2016

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Introduction

Ameren Missouri engaged Cadmus to perform annual process and impact evaluations of the following residential energy efficiency programs for a three-year period, from 2016 through 2018:

- Heating and Cooling
- Lighting
- Efficient Products (including an evaluation of smart thermostats)
- Energy Efficiency Kits
- Home Energy Reports

This annual summary report presents key energy savings, demand reduction, and cost-effectiveness results for Program Year 2016 (PY16), the period from March 1, 2016, through February 28, 2017. While Cadmus evaluated smart thermostats as a part of the Efficient Products program, this summary report presents findings specific to smart thermostats independently throughout the document.

Separate, program-specific PY16 evaluation reports offer significantly more detail regarding impact methodologies used and results as well as key process evaluation findings, conclusions, and recommendations.

Energy Savings

Table 1 summarizes *ex ante* gross, *ex post* gross, and *ex post* net energy savings (MWh/year) for each program and for the overall residential portfolio in PY16. The table also compares Cadmus' *ex post* net energy savings to the program-specific and residential portfolio net energy savings targets, approved by Missouri Public Service Commission (MPSC).

As the table shows, the residential portfolio achieved 122% of its energy savings target for PY16 when *ex ante* values for HER is included.



Table 1. Summary of PY16 Residential Programs' Energy Savings (MWh/Year)

Program	MPSC-Approved Target	Planning Gross Savings Utility Reported ¹	Ex Post Gross Savings Determined by EM&V ²	Ex Post Net Savings Determined by EM&V ³	Percent of Goal Achieved ⁴
Efficient Products	4,760	2,883	2,940	2,195	46%
Smart Thermostats	2,087	3,788	3,732	3,201	153%
Energy Efficiency Kits	6,194	4,773	5,478	4,217	68%
Home Energy Reports	33,750	33,750	32,292 ⁵	32,292 ⁵	96%
Heating and Cooling	31,399	49,539	44,661	58,443	186%
Lighting	24,923	27,810	38,439	25,562	103%
Portfolio w/HER	103,113	122,543	127,542	125,910	122%
Portfolio w/o HER	69,363	88,794	95,250	93,618	135%

¹ Documented by the Vision database.

² MWh calculated by applying verified program activity to the Cadmus' evaluated savings values.

³ Calculated by multiplying Cadmus' evaluated gross savings and evaluated net-to-gross (NTG) ratio, and adding program-level nonparticipant spillover to each program.

⁴ Compares MPSC-approved target and *ex post* net savings, determined by evaluation, measurement, and verification (EM&V).

⁵ *Ex ante* value.

Demand Reduction

Table 2 summarizes *ex ante* gross, *ex post* gross, and *ex post* net demand reduction (kW) for each program and for the residential portfolio overall, and it compares Cadmus' *ex post* net demand reductions to MPSC-approved targets.

Energy savings and demand reductions do not perfectly correlate (as the measure mix for some programs generates more peak savings). The portfolio exceeded its demand reduction target for PY16: 131% when HER is included and 151% when HER is not included.

Table 2. Summary of PY16 Residential Program Demand Reductions (kW)¹

Program	MPSC-Approved Target	Planning Gross Savings (Prior to Evaluation) ²	Ex Post Gross Savings Determined by EM&V ³	Ex Post Net Savings Determined by EM&V ⁴	Percent of Goal Achieved ⁵
Efficient Products	1,399	655	748	537	38%
Smart Thermostats	1,981	3,589	3,535	2,964	150%
Energy Efficiency Kits	1,017	1,201	995	811	80%
Home Energy Reports	15,720	15,720	15,051 ⁶	15,051 ⁶	96%
Heating and Cooling	20,032	32,578	30,332	34,088	170%
Lighting	3,711	4,151	5,782	4,115	111%
Portfolio w/HER	43,860	57,894	56,443	57,566	131%
Portfolio w/o HER	28,140	42,174	41,392	42,515	151%

¹The Non-Unanimous Stipulation and Agreement in File No. EO-2015-0055 states: “Only measures that are expected to deliver energy savings in 2023 and beyond are counted towards the demand goal in the EO included in Appendix A.” Cadmus referenced the Ameren Missouri TRM for secondary data on measure EUL in order to assess whether or not measures are sufficiently long-lived to apply the stipulated energy to-demand ratio to determine 2023-persistent kW savings. Demand savings resulting from Smart Thermostats and HER are not counted toward this goal.

² Documented by the Vision database

³ Demand reductions (kW) calculated by applying coincident factors Ameren Missouri 2016-2018 Energy Efficiency Plan. MPSC file number EO-2015-0055 Appendix E to evaluated energy savings.

⁴ Calculated by multiplying Cadmus’ evaluated gross savings and evaluated NTG ratio.

⁵ Compares MPSC approved target and *ex post* net savings, determined by EM&V.

⁶ *Ex ante* value.

Cost Effectiveness

Using final PY16 program participation and implementation data as well as *ex post* gross and net savings estimates presented in this report. Ameren Missouri determined the PY16 programs’ and the residential portfolio’s cost-effectiveness using DSMore (a financial analysis tool designed to evaluate costs, benefits, and risks from demand-side management [DSM] programs and services). As shown in the Cost-Effectiveness Details section, Ameren Missouri assessed cost-effectiveness using all five of DSMore’s standard perspectives:

- Utility Cost Test (UCT)
- Total Resource Cost (TRC)
- Ratepayer Impact Test (RIM)
- Societal Cost Test (SCT)
- Participant Cost Test (PART)

All cost-effectiveness results shown include the program’s share of portfolio-level or indirect costs, determined using the present value of each program’s UCT lifetime benefits (i.e., the present value 2016 dollars of avoided generation costs as well as deferral of capacity costs for capital, transmission, and distribution). The Cost-Effectiveness Details section provides further details.



Collectively, the five residential programs resulted in UCT and TRC cost-effective ratios of 6.26 and 3.99, respectively, at a portfolio level (shown in Table 3). In total, the residential portfolio generated just over \$99.1 million dollars in annual net shared benefits, as shown in Table 4.¹

Table 3. Summary of PY16 Residential Program Cost-Effectiveness

Program	UCT	TRC	RIM	SCT	PART*
Efficient Products	1.41	1.00	0.44	1.36	3.66
Smart Thermostats	3.42	1.98	0.80	2.55	2.92
Energy Efficiency Kits	3.57	5.73	0.52	11.14	N/A
Home Energy Reports	2.68	2.68	0.48	2.68	N/A
Heating and Cooling	7.47	4.01	0.86	5.56	5.74
Lighting	5.91	5.91	0.49	8.83	N/A
Portfolio	6.26	3.99	0.72	5.65	9.18

* Home Energy Reports have no participant costs. Lighting program’s lifetime participant costs are lower, even though upfront costs are higher.

Table 4 details program benefits and costs used to determine annual net shared benefits for the UCT, in 2016 dollars. Annual net shared benefits are net of costs borne by the utility, but not costs borne by other parties. For example, the report includes the incentive cost, which the utility accrued. It does not include remaining incremental measure costs if the incentive did not fully cover them (hence the participant paid the costs).

Table 4. Summary of PY16 Annual Net Shared Benefits (2016 Dollars)

Program	UTC Net Lifetime Benefits ¹	Program Costs ²	Annual Net Shared Benefits ³
Efficient Products	\$1,314,304	\$930,914	\$383,391
Smart Thermostats	\$3,951,419	\$1,155,451	\$2,795,968
Energy Efficiency Kits	\$3,114,420	\$873,553	\$2,240,867
Home Energy Reports	\$1,622,880	\$606,178	\$1,016,701
Heating and Cooling	\$84,742,921	\$11,342,028	\$73,400,892
Lighting	\$23,090,820	\$3,909,659	\$19,181,162
Portfolio⁴	\$117,836,764	\$18,817,783	\$99,018,981

¹ UTC Net Lifetime Benefits equal the value (in 2016 dollars) of utility-avoided costs over the measure’s lifetime, based on evaluated net savings applied at the measure level.

² Program costs at the portfolio level include costs in addition to the program-level costs.

³ Annual net shared benefits, as defined in 4 CSR 240-20.094(1)(C), when using avoided costs or avoided utility costs defined in 4 CSR 240-20.094(1)(D), are the same as UCT Net Lifetime Benefits Minus Costs.

⁴ May not sum exactly due to rounding.

¹ Annual net shared benefits, as defined in 4 CSR 240-20.093(1), are the utility’s avoided costs, measured and documented through EM&V reports for approved demand-side programs, less the sum of the programs’ costs (including design, administration, delivery, end-use measures, incentives, EM&V, utility market potential studies, and technical resource manuals) on an annual basis. Annual net shared benefits equal lifetime benefits (based on evaluated net savings), less program costs.

By program, Table 5 details costs and benefits pertaining to TRC test results, which include all costs paid by either the utility or the participant. For example, this would include both incentive costs and incremental measure costs. Though TRC costs are higher than UCT costs (as they include more costs), benefits stay the same.

Table 5. Summary of TRC Benefits and Costs (2016 Dollars)

Program	TRC Net Lifetime Benefits	Costs ¹	TRC Net Lifetime Benefits Less Costs ²
Efficient Products	\$1,314,304	\$1,319,364	(\$5,060)
Smart Thermostats	\$3,957,191	\$1,992,277	\$1,959,142
Energy Efficiency Kits	\$3,114,420	\$543,255	\$2,571,165
Home Energy Reports	\$1,622,880	\$606,178	\$1,016,701
Heating and Cooling	\$84,742,921	\$21,127,075	\$63,615,845
Lighting	\$23,090,820	\$3,909,659	\$19,181,162
Portfolio²	\$117,836,764	\$29,497,809	\$88,338,956

¹ The portion of portfolio costs distributed across programs are included in this table's program costs (see Table 7 for details on program and portfolio spending).

² May not sum exactly due to rounding.

The UCT and TRC receive the most analysis in this report as they are the most common cost-effectiveness tests used. Cadmus, however, also reports on the RIM, SCT, and PCT. Table 6 shows costs included in each test reviewed in this report.

Table 6. Costs Associated with Each Cost-Effectiveness Test

Test	Costs Included
UCT	All costs paid by the utility directly.
TRC	All costs paid by the utility or the participant.
RIM	All costs paid by the utility or the participant, and the revenue loss associated with reduced sales.
SCT	All costs paid by the utility or the participant.
PCT	All costs paid by the participant.



Cost-Effectiveness Details

Methodology

As discussed, Ameren Missouri assessed cost-effectiveness using five tests, as defined by the California Standard Practice Manual:²

- TRC
- UCT
- RIM
- SCT
- PART

DSMore takes hourly prices and hourly energy savings from specific measures installed through the Residential Portfolio, and correlates prices and savings to 33 years of historic weather data. Using long-term weather ensures that the model captures low-probability, high-consequence weather events, and appropriately values these. As a result, the model produces an accurate evaluation of the demand-side efficiency measure relative to other alternative supply options.

Ameren Missouri used evaluated results for model inputs (e.g., PY16 program-specific participation counts, per-unit gross savings, NTG, and NPSO).

Measure load shapes particularly drove model assumptions, as indicated when the model applied savings during the day. This ensured that load shapes for an end use matched system peak impacts of that end use, providing the correct summer coincident savings. Ameren Missouri used measure lifetime assumptions and incremental costs based on the program database, the Ameren Missouri TRM, or the original Batch Tool.

A key step in the analysis process required PY16 Ameren Missouri program-spending data: actual spending, broken down into contractor administration, incentives, and marketing costs. Ameren Missouri applied contractor administration, marketing, and other costs—including R&D, EM&V, Educational Outreach, Portfolio Administration, Potential Study, and Data Tracking—at the program level, while incentives were applied at the measure level.

Table 7 summarizes PY16 electric spending by program and by other portfolio-related activities.

² *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*. October 2001.

Table 7. Ameren Missouri PY16 Spending Data

2016 Residential Program Costs	Non-Incentive Costs	Incentive Costs	Total Costs
Efficient Products	\$479,514	\$435,870	\$915,384
Smart Thermostats	\$288,761	\$820,000	\$1,108,761
Energy Efficiency Kits	\$253,634	\$583,119	\$836,753
Home Energy Reports	\$587,002	\$0	\$587,002
Heating and Cooling	\$3,822,678	\$6,518,025	\$10,340,703
Lighting	\$1,395,823	\$2,240,993	\$3,636,817
Total Residential Programs¹	\$6,827,412	\$10,598,007	\$17,425,420
2016 Other Portfolio Costs			
General	\$443,211	\$0	\$443,211
Marketing	\$201,751	\$0	\$201,751
EM&V	\$766,970	\$0	\$766,970
Total Other¹	\$1,411,932	\$0	\$1,411,932
Total Portfolio Costs¹	\$8,239,344	\$10,598,007	\$18,837,352

¹ May not sum exactly due to rounding.

Table 8 summarizes benefit and cost inputs for each cost-effectiveness test.

Table 8. Summary of Benefits and Costs Included in Each Cost-Effectiveness Test

Test	Benefits	Costs
UCT	Perspective of utility, government agency, or third-party program implementer	
	<ul style="list-style-type: none"> Energy-related avoided costs Capacity-related costs avoided by the utility, including generation, transmission, and distribution 	<ul style="list-style-type: none"> Program overhead costs Utility/program administrator incentive costs Utility/program administrator installation costs
TRC	Perspective of all utility customers (participants and nonparticipants) in the utility service territory	
	<ul style="list-style-type: none"> Energy-related avoided costs Capacity-related avoided costs, including generation, transmission, and distribution Additional resource savings Applicable tax credits 	<ul style="list-style-type: none"> Program overhead costs Program installation costs Incremental measure costs (whether paid by customer or utility)¹
RIM	Impact of efficiency measure on nonparticipating ratepayers overall	
	<ul style="list-style-type: none"> Energy-related avoided costs Capacity-related avoided costs, including generation, transmission, and distribution 	<ul style="list-style-type: none"> Program overhead costs Utility/program administrator incentives Utility/program administrator installation costs Lost revenue due to reduced energy bills
SCT	Perspective of all utility customers (participants and nonparticipants) in the utility service territory (uses a societal discount rate)	
	<ul style="list-style-type: none"> Energy-related avoided costs 	<ul style="list-style-type: none"> Program overhead costs Program installation costs



Test	Benefits	Costs
	<ul style="list-style-type: none"> Capacity-related avoided costs, including generation, transmission, and distribution Additional resource savings Applicable tax credits Non-energy benefits 	<ul style="list-style-type: none"> Incremental measure costs (whether paid by customer or utility)¹
	Perspective of the customers installing the measures	
PCT	<ul style="list-style-type: none"> Bill savings Incremental installation costs Applicable tax credits or incentives 	<ul style="list-style-type: none"> Incentive payments Incremental equipment costs

¹ Incentives are considered in the incremental measure costs

As the report presents the majority of costs and savings on a net basis, the NTG ratio was applied to account for free ridership, spillover, and market effect impacts. The report, however, presents participant-borne costs, as applied to the PCT, on a gross basis.

Residential Portfolio

Table 9 through Table 13 show total benefits and costs for the residential portfolio, along with benefit/cost ratios for each cost-effectiveness test. As shown, applying the residential portfolio to the UCT, TRC, PART, and SCT tests resulted in generation of more than \$117 million in UCT gross lifetime benefits and \$99 million in UCT net lifetime benefits.

Table 9. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$56,686,464	
Avoided Electric Capacity	\$48,971,892	
Avoided T&D Electric	\$12,178,408	
Incentives		\$8,265,592
Program Overhead Costs		\$10,552,191
Total	\$117,836,764	\$18,817,783
UCT Benefit/Cost Ratio	6.26	

Table 10. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$56,686,464	
Avoided Electric Capacity	\$48,971,892	
Avoided T&D Electric	\$12,178,408	
Participant Costs (Net)		\$17,705,290
Program Overhead Costs		\$11,792,519
Total	\$117,836,764	\$29,497,809
TRC Benefit/Cost Ratio	3.99	

Table 11. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$56,686,464	
Avoided Electric Capacity	\$48,971,892	
Avoided T&D Electric	\$12,178,408	
Program Overhead Costs		\$10,552,191
Incentives		\$8,265,592
Lost Revenue		\$144,907,380
Total	\$117,836,764	\$162,915,163
RIM Benefit/Cost Ratio	0.72	

Table 12. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$77,689,484	
Avoided Electric Capacity	\$66,608,303	
Avoided T&D Electric	\$15,471,654	
Program Overhead Costs		\$10,552,191
Participant Costs (Net)		\$17,705,290
Total	\$159,769,441	\$28,257,482
SCT Benefit/Cost Ratio	5.65	

Table 13. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$179,349,665	
Incentives	\$8,265,592	
Participant Costs (Gross)		\$20,430,888
Total	\$187,615,257	\$20,430,888
PCT Benefit/Cost Ratio	9.18	

Efficient Products

Table 14 through Table 18 show total benefits and costs for the Efficient Products program (excluding smart thermostats), along with the benefit/cost ratio for each cost-effectiveness test. Smart thermostats are shown separately in the following section.

Table 14. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$822,282	
Avoided Electric Capacity	\$385,236	
Avoided T&D Electric	\$106,786	
Incentives		\$425,230
Program Overhead Costs		\$505,674
Total	\$1,314,304	\$930,917
UCT Benefit/Cost Ratio	1.41	

Table 15. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$822,282	
Avoided Electric Capacity	\$385,236	
Avoided T&D Electric	\$106,786	
Participant Costs (Net)		\$675,682
Program Overhead Costs		\$643,682
Total	\$1,314,304	\$1,319,364
TRC Benefit/Cost Ratio	1.00	

Table 16. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$822,282	
Avoided Electric Capacity	\$385,236	
Avoided T&D Electric	\$106,786	
Program Overhead Costs		\$505,684
Incentives		\$425,230
Lost Revenue		\$2,088,157
Total	\$1,314,304	\$3,019,071
RIM Benefit/Cost Ratio	0.44	

Table 17. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,002,765	
Avoided Electric Capacity	\$481,433	
Avoided T&D Electric	\$125,779	
Program Overhead Costs		\$505,684
Participant Cost (net)		\$675,682
Total	\$1,609,978	\$1,181,365
SCT Benefit/Cost Ratio	1.36	

Table 18. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$2,880,606	
Participant Bill Savings (Natural Gas, Gross)		
Incentives	\$425,230	
Participant Costs (Gross)		\$902,623
Total	\$3,305,836	\$902,623
PCT Benefit/Cost Ratio	3.66	

Smart Thermostats

Table 19 through Table 23 show total benefits and costs for smart thermostats provided through the Efficient Products program, along with the benefit/cost ratio for each cost-effectiveness test.

Table 19. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,218,727	
Avoided Electric Capacity	\$2,126,997	
Avoided T&D Electric	\$606,695	
Incentives		\$820,000
Program Overhead Costs		\$335,451
Total	\$3,951,419	\$1,155,451
UCT Benefit/Cost Ratio	3.42	



Table 20. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,218,727	
Avoided Electric Capacity	\$2,126,997	
Avoided T&D Electric	\$605,695	
Participant Costs (Net)		\$1,511,686
Program Overhead Costs		\$480,591
Total	\$3,951,419	\$1,992,277
TRC Benefit/Cost Ratio	1.98	

Table 21. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,218,727	
Avoided Electric Capacity	\$2,126,997	
Avoided T&D Electric	\$605,695	
Program Overhead Costs		\$335,451
Incentives		\$820,000
Lost Revenue		\$3,763,295
Total	\$3,951,419	\$4,918,746
RIM Benefit/Cost Ratio	0.80	

Table 22. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,430,704	
Avoided Electric Capacity	\$2,587,885	
Avoided T&D Electric	\$698,835	
Program Overhead Costs		\$335,451
Participant Cost (Net)		\$1,511,686
Total	\$4,717,424	\$1,847,137
SCT Benefit/Cost Ratio	2.55	

Table 23. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$4,541,308	
Participant Bill Savings (Natural Gas, Gross)	\$0	
Incentives	\$820,000	
Participant Costs (Gross)		\$1,836,800
Total	\$5,361,308	\$1,836,800
PTC Benefit/Cost Ratio	2.92	

Energy Efficiency Kits

Table 24 through Table 28 show total benefits and costs for the Energy Efficiency Kits program, along with the benefit/cost ratio for each cost-effectiveness test.

Table 24. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$2,068,239	
Avoided Electric Capacity	\$837,309	
Avoided T&D Electric	\$208,873	
Incentives		\$502,336
Program Overhead Costs		\$371,217
Total	\$3,114,420	\$873,553
UCT Benefit/Cost Ratio	3.57	

Table 25. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$2,068,239	
Avoided Electric Capacity	\$837,309	
Avoided T&D Electric	\$208,873	
Participant Costs (Net)		
Program Overhead Costs		\$543,255
Total	\$3,114,420	\$543,255
TRC Benefit/Cost Ratio	5.73	

Table 26. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$2,068,239	
Avoided Electric Capacity	\$837,309	
Avoided T&D Electric	\$208,873	
Program Overhead Costs		\$371,217
Incentives		\$502,336
Lost Revenue		\$5,067,919
Total	\$3,114,420	\$5,941,472
RIM Benefit/Cost Ratio	0.52	



Table 27. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$2,766,822	
Avoided Electric Capacity	\$1,107,393	
Avoided T&D Electric	\$259,888	
Program Overhead Costs		\$371,217
Participant Cost (Net)		
Total	\$4,134,103	\$371,217
SCT Benefit/Cost Ratio	11.14	

Table 28. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$6,976,400	
Participant Bill Savings (Natural Gas, Gross)		
Incentives	\$502,336	
Participant Costs (Gross)		
Total	\$7,478,736	
PCT Benefit/Cost Ratio	N/A	

Home Energy Report

Table 29 through Table 33 show total benefits and costs for the Home Energy Report program, along with the benefit/cost ratio for each cost-effectiveness test. For purposes of cost effectiveness, Ameren Missouri used ex ante savings as an input, since annual evaluated savings were not available.

Table 29. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,065,047	
Avoided Electric Capacity	\$188,547	
Avoided T&D Electric	\$369,285	
Incentives		
Program Overhead Costs		\$606,178
Total	\$1,622,880	\$606,178
UCT Benefit/Cost Ratio	2.68	

Table 30. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,065,047	
Avoided Electric Capacity	\$188,547	
Avoided T&D Electric	\$369,285	
Participant Costs (Net)		
Program Overhead Costs		\$606,178
Total	\$1,622,880	\$606,178
TRC Benefit/Cost Ratio	2.68	

Table 31. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,065,047	
Avoided Electric Capacity	\$188,547	
Avoided T&D Electric	\$369,285	
Program Overhead Costs		\$606,178
Incentives		
Lost Revenue		\$2,781,532
Total	\$1,622,880	\$3,387,710
RIM Benefit/Cost Ratio	0.48	

Table 32. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$1,065,047	
Avoided Electric Capacity	\$188,547	
Avoided T&D Electric	\$369,285	
Program Overhead Costs		\$606,178
Participant Cost (Net)		
Total	\$1,622,880	\$606,178
SCT Benefit/Cost Ratio	2.68	



Table 33. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$2,781,532	
Incentives		
Participant Costs (Gross)		
Total	\$2,781,532	
PCT Benefit/Cost Ratio	N/A	

Heating and Cooling

Table 34 through Table 38 show total benefits and costs for the Heating and Cooling program, along with the benefit/cost ratio for each cost-effectiveness test.

Table 34. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$32,923,952	
Avoided Electric Capacity	\$41,768,009	
Avoided T&D Electric	\$10,050,960	
Incentives		\$6,518,025
Program Overhead Costs		\$4,824,003
Total	\$84,742,921	\$11,342,028
UCT Benefit/Cost Ratio	7.47	

Table 35. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$32,923,952	
Avoided Electric Capacity	\$41,768,009	
Avoided T&D Electric	\$10,050,960	
Participant Costs (Net)		\$15,517,922
Program Overhead Costs		\$5,609,154
Total	\$84,742,921	\$21,127,075
TRC Benefit/Cost Ratio	4.01	

Table 36. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$32,923,952	
Avoided Electric Capacity	\$41,768,009	
Avoided T&D Electric	\$10,050,960	
Program Overhead Costs		\$4,824,003
Incentives		\$6,518,025
Lost Revenue		\$87,302,227
Total	\$84,742,921	\$98,644,255
RIM Benefit/Cost Ratio	0.86	

Table 37. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$43,518,232	
Avoided Electric Capacity	\$56,790,541	
Avoided T&D Electric	\$12,853,866	
Program Overhead Costs		\$4,824,003
Participant Cost (Net)		\$15,517,922
Total	\$113,162,640	\$20,341,925
SCT Benefit/Cost Ratio	5.56	

Table 38. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$95,045,640	
Incentives	\$6,518,025	
Participant Costs (Gross)		\$17,691,464
Total	\$101,563,665	\$17,691,464
PCT Benefit/Cost Ratio	5.74	

Lighting

Table 39 through Table 43 show total benefits and costs for the Lighting program, along with the benefit/cost ratio for each cost-effectiveness test.



Table 39. Utility Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$18,588,218	
Avoided Electric Capacity	\$3,665,794	
Avoided T&D Electric	\$836,808	
Incentives		\$1
Program Overhead Costs		\$3,909,658
Total	\$23,090,820	\$3,909,659
UCT Benefit/Cost Ratio	5.91	

Table 40. Total Resource Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$18,588,218	
Avoided Electric Capacity	\$3,665,794	
Avoided T&D Electric	\$836,808	
Participant Costs (Net)		\$1
Program Overhead Costs		\$3,909,658
Total	\$23,090,820	\$3,909,659
TRC Benefit/Cost Ratio	5.91	

Table 41. Ratepayer Impact Measure Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$18,588,218	
Avoided Electric Capacity	\$3,665,794	
Avoided T&D Electric	\$836,808	
Program Overhead Costs		\$3,909,658
Incentives		\$1
Lost Revenue		\$43,094,250
Total	\$23,090,820	\$47,003,908
RIM Benefit/Cost Ratio	0.49	

Table 42. Societal Cost Test Inputs and Results

	Benefits	Costs
Avoided Electric Production	\$27,905,913	
Avoided Electric Capacity	\$5,452,503	
Avoided T&D Electric	\$1,164,000	
Program Overhead Costs		\$3,909,658
Participant Cost (net)		\$1
Total	\$34,522,416	\$3,909,658
SCT Benefit/Cost Ratio	8.83	

Table 43. Participant Cost Test Inputs and Results

	Benefits	Costs
Participant Bill Savings (Electric, Gross)	\$67,124,180	
Incentives	\$1	
Participant Costs (Gross)		\$1
Total	\$67,124,181	\$1
PCT Benefit/Cost Ratio	N/A	