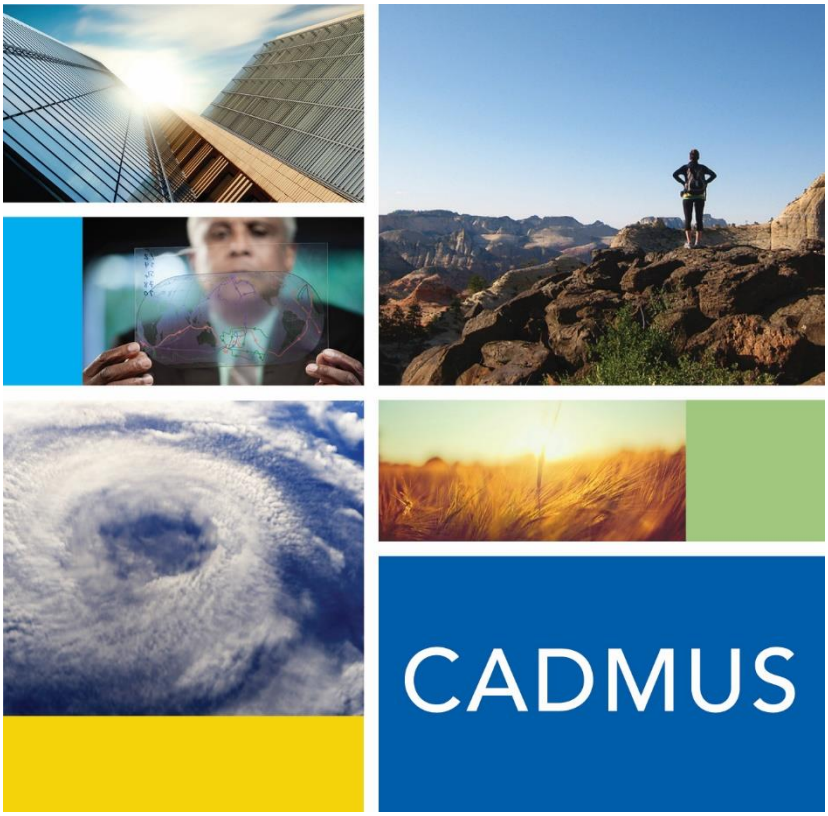

Ameren Missouri Energy Efficiency Kits Program Impact and Process Evaluation: Program Year 2016

July 13, 2017

Ameren Missouri

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Executive Summary

Ameren Missouri engaged Cadmus to perform annual process and impact evaluations of the Energy Efficiency Kits program for a three-year period, from 2016 through 2018. This annual report covers the impact and process evaluation findings for Program Year 2016 (PY16), the period from March 1, 2016, through February 28, 2017—the first year of the three-year program cycle.

Program Description

In PY16, the program provided energy efficiency kits through two separate delivery channels:

- **School-Based Delivery Channel.** Ameren Missouri began offering this delivery channel in PY16. Participating teachers receive classroom curriculum and energy saving school kits (school kits) to distribute to their students.
- **Multifamily Delivery Channel.** While this delivery channel was offered in PY15 through the Efficient Products program, the PY16 launch date was delayed until February 2017 and only one property manager participated. This delivery channel provides energy savings multifamily kits (multifamily kits) to property managers of eligible multifamily homes. To become eligible, properties must have three or more rental units and must have electric water heaters. The property manager (or staff) installs multifamily kit items in each of the property's units.

School kits contained one energy-efficient showerhead, one energy-efficient kitchen faucet aerator, one energy-efficient bathroom faucet aerator, one furnace filter alarm, three feet of water heater pipe wrap and four LEDs. Multifamily kits contained one energy-efficient showerhead, one energy-efficient kitchen faucet aerator, one energy-efficient bathroom faucet aerator, one furnace filter alarm, six feet of water heater pipe wrap, and four LEDs. However, in PY16, Ameren Missouri did not distribute showerheads and furnace filter alarms as part of the multifamily delivery channel because only one property participated that did not require these items.

For PY16–18, Ameren contracted with ICF International (ICF) to implement the program. ICF implements the multifamily and school-based delivery channels, with support from National Energy Foundation (NEF) for delivery of the school-based delivery channel.

For the multifamily kit delivery channel, ICF developed marketing materials and collateral, delivered and tracked multifamily kit items, and managed enrollment. For the school-based delivery channel, NEF developed the school kit curriculum, built awareness of the program with eligible schools, delivered and tracked the school kits and program materials, enrolled teachers, and conducted day-to-day management. NEF wrote the curriculum materials for a sixth-grade level and confirmed their appropriateness with the Missouri Department of Education.

Key Impact Evaluation Findings

This section describes Cadmus' key findings for the PY16 evaluation period.

Program Data and Program Data Adjustments

In PY16, the implementation team tracked program data in the Vision database, which was designed to make program data accessible to program administrators and evaluators in real time.

For the school-based delivery channel, the Vision database tracked shipments of school kits from Ameren Missouri to the implementer (NEF). To verify these school kits, the team compared the number of school kits tracked in the Vision database to NEF's shipment data, which included the number of school kits shipped to each school. Given this was a school delivery channel and student contact data was private, tracking data did not include account numbers or customer information. Thus the team could not verify who received the measures. However, because the team could verify that the number of kits tracked in the Vision database was consistent with NEF's shipment data, the team did not adjust reported quantities for this delivery channel.

For the multifamily delivery channel, the Vison database tracked shipments of multifamily kits from Ameren Missouri to the one participating property manager. The team did not make any adjustments to measure quantities for this delivery channel.

Gross Impacts

As shown in Table 1, Cadmus estimated per-unit gross realization rates for all Energy Efficiency Kit measures as the ratio of Ameren Missouri's *ex ante* savings from its 2017 Technical Resource Manual (TRM) export and our evaluated (*ex post*) savings.[1]

The team found the following measures achieved the highest realization rates for the school kit: energy-efficient kitchen faucet aerators (314%); energy-efficient bathroom faucet aerators (184%); and energy-efficient showerheads (182%). The team attributed these higher realization rates to higher than expected average household size and higher than expected counts of faucets and showerheads per home. Energy-efficient kitchen faucet aerators exhibited the highest realization rate for the multifamily kits (148%).

Table 1 summarizes PY16 participation, *ex post* gross per-unit savings, realization and installation rates, and *ex post* total gross savings. For the school-based delivery channel, it shows the adjustment for electric water heating saturation and percentage of survey respondents that were Ameren Missouri customers.

[1] Ameren Missouri. *Technical Resource Manual.* 2017. Ameren Missouri Measure Listing for MEEIA Cycle 2016-18

Table 1. PY16 Summary: *Ex Post* Program Gross Savings Accounting for Installation Rates

Measure	PY16 Participation[a]	Per-Unit *Ex Post* Savings (kWh/yr)	Realization Rate	Percent Installed and Operating	Electric Water Heating Saturation	Ameren Missouri Customers	Total *Ex Post* Gross Savings (MWh/yr)[c]	Total *Ex Post* Gross Savings (kW/yr)
School Kits								
Energy-Efficient Showerhead	16,245	330.53	182%	65%	40%	86%	1,195	106
Energy-Efficient Kitchen Faucet Aerator	16,245	250.12	314%	53%	40%	86%	746	66
Energy-Efficient Bathroom Faucet Aerator	16,245	40.72	184%	57%	40%	86%	129	11
LEDs	64,980	37.91	101%	92%	100%	86%	1,939	289
Water Heater Pipe Wrap	48,735	25.99	100%	74%	40%	86%	321	N/A
Furnace Filter Alarm	16,245	168.29	86%	47%	100%	86%	1,112	518
Multifamily Kits								
Energy-Efficient Showerhead[b]	-	-	-	-	-	-	-	-
Energy-Efficient Kitchen Faucet Aerator	82	115.87	148%	100%	100%	100%	10	.8
Energy-Efficient Bathroom Faucet Aerator	82	33.46	88%	100%	100%	100%	3	.2
LEDs	328	37.91	101%	98%	100%	100%	12	1.8
Water Heater Pipe Wrap	492	22.68	100%	100%	100%	100%	11	N/A
Furnace Filter Alarm[b]	-	-	-	-	-	-	-	-

[a] Verified measures.

[b] Ameren Missouri did not claim savings for these two measures.

[c] Measure gross savings may not sum to total due to rounding.

Net Savings

As shown in Table 2, the school-based delivery channel had an overall savings-weighted, net-to-gross (NTG) ratio (excluding NPSO) of 76.8%, and the multifamily delivery channel had an overall savings-weighted NTG ratio (excluding NPSO) of 90.5%. NPSO is separately accounted for because it has a different load shape and therefore different demand impacts than the direct program savings.

Table 2. PY16 Net Impact Results Summary

Delivery Channel	*Ex Post* Gross Savings (kWh/yr)	Free Ridership	Participant Spillover	NTG (w/o NPSO)	Net Savings (MWh/yr)	Net Savings (kW/yr)
SchoolKit	5,442,740	28.0%	4.8%	76.8%	4,179	807
MultifamilyKit	35,589	12.9%	3.4%	90.5%	32	2.5
Nonparticipant Spillover	-	-	-	-	5	2
Total	**5,478,328**				**4,217**	**811**

As shown in Table 3, the PY16 program achieved 68% of its net energy savings target of 6,194 MWh, as specified in Ameren Missouri's residential filing.[2] Appendix A presents the coincidence factors used to calculate demand savings for this program.

Table 3. PY16 Energy Efficiency Kits Savings Comparisons

Metric	MPSC-Approved Target	*Ex Ante* Gross Savings Utility Reported[a]	*Ex Post* Gross Savings Determined by EM&V[b]	*Ex Post* Net Savings Determined by EM&V[c]	Percent of Goal Achieved[d]
Energy (MWh)	6,194	4,773	5,478	4,217	68%
Demand (kW)	1,017	1,201	995	811	80%

[a]Calculated by applying verified program activity to program tracking data in Vision.

[b]MWh calculated by applying verified program activity to Cadmus' evaluated savings values; kW calculated by applying coincident factors provided in Appendix A.

[c]Calculated by multiplying the team's evaluated gross savings and evaluated NTG ratio and adding total program NPSO.

[d]Compares MPSC Approved Target and *Ex Post* Net Savings Determined by EM&V.

[2] Union Electric Company. d/b/a Ameren Missouri's 2nd Filing to Implement Regulatory Changes in Furtherance of Energy File No. EO-2015-0055 Efficiency as Allowed by MEEIA. Appendix B. MEEIA 2016-2018 Summary

CSR Impact Evaluation Requirements

According to the Missouri Code of State Regulations (CSR),[3] demand-side programs functioning as part of a utility's preferred resource plan become subject to ongoing process and impact evaluations that meet certain criteria. Specifically, the CSR requires that impact evaluations of a demand-side program satisfy the requirements listed in Table 4. The table also indicates data the team used to satisfy these impact CSR evaluation requirements for the Energy Efficiency Kits program. This report provides a summary of the process CSR requirements in Table 5, at the end of the Process Evaluation section.

[3] State of Missouri. "Administrative Rules: Missouri Code of State Regulations." Revised January 2016. Available online: http://www.sos.mo.gov/adrules/csr/csr.asp

Table 4. Summary Responses to CSR Impact Evaluation Requirements

CSR Requirement	Method Used	Description of Program Method
Approach: The evaluation must use one or both of the following comparisons to determine the program's impact:		
Comparisons of pre-adoption and post-adoption loads of program participants, corrected for the effects of weather and other intertemporal differences	✓	The program compares the pre-adoption load, based on assumed baseline technology with the post-adoption load, based on program technology.
Comparisons between loads for program participants and an appropriate control group over the same period		
Data: The evaluation must use one or more of the following data types to assess program impact:		
Monthly billing data		
Hourly load data		
Load research data		
End-use load metered data	✓	The evaluator used PY16 HVAC metering study to determine Equivalent Full Load Hours Heating.
Building and equipment simulation models	✓	The evaluator used PY16 Building Simulation Modeling, adjusted for heating and cooling saturations, to determine the waste-heat factor of efficient lighting.
Survey responses	✓	For the school-based delivery channel, the evaluator relied on the following: PY16 participant surveys to determine installation rates; number of people per household; number of kitchen and bathroom faucets, and showerheads per household; and electric water heating saturations. For the multifamily kit delivery channel, the evaluator used PY15 installation rates.
Audit and survey data on:		
Equipment type/size efficiency		
Household or business characteristics	✓	For the school-based delivery channel, the evaluator relied on PY16 participant surveys to determine the number of household occupants, the number of kitchen and bathroom faucets, and the number of showerheads. For the multifamily kit delivery channel, the evaluator used PY15 data.
Energy-related building characteristics	✓	For the school-based delivery channel, the evaluator relied on PY16 participant surveys to determine electric water heating saturation. For the multifamily kit delivery channel, the evaluator used PY15 data.

Key Process Evaluation Findings

Cadmus conducted interviews with program stakeholders, reviewed program tracking data and marketing materials, and surveyed recipients of the school kits to inform the PY16 process evaluation. Key research findings follow.

Marketing and Outreach

In PY16, program marketing and outreach differed between the school-based and multifamily delivery channels. For the school-based delivery channel, NEF sent letters to principals from a list of qualifying schools and followed up with subsequent emails about the program. For the multifamily delivery channel, ICF was responsible for raising awareness. In PY16, implementation staff used a list of property managers, generated by Ameren Missouri's Low Income program, as an initial list of property managers owning rental units with electric water heaters. ICF staff then identified the property managers on this list that also owned market rate units and marketed the multifamily kits to this group.

Cadmus found that marketing materials for both school-based and multifamily delivery channels follow best practices however some visual elements could be improved (e.g., the school kit fall invite e-mail's design, the above-average amount of open space on the multifamily kit brochure).

Benchmarking

Of five benchmarked school kit programs, Ameren Missouri's school-based delivery channel sent out one of the greatest number of school kits. The school kits contained all of the most common measures, apart from an LED night light, which the five other benchmarked programs offered. While Ameren Missouri targeted sixth-grade students, benchmarked school kit programs most commonly targeted fifth-grade students.

Ameren Missouri's multifamily kit contained measures similar to that of the benchmarked programs, as well as other measures not typically offered by other similar programs (e.g., LED light bulbs, pipe wrap).

Participant Satisfaction

Both teachers and participating families expressed enthusiasm about the school-based delivery channel. Every teacher interviewed would (or already did) recommend the program to other teachers and would participate again in the future. A majority of surveyed families wanted Ameren Missouri's school-based delivery channel continued in local schools (99%, n=397). Although the installation materials directed parents and teachers to online installation videos, some were not aware of them. Participating parents gave the following suggestions for improvement: giving parents an option to return unused items, additional instruction on how to install the school kit items, additional information about the program, and one requested a video walkthrough of the kit so families could watch how to install the items on YouTube prior to installing the measures. Teachers reported that some households had trouble installing certain kit measures such as the efficient showerheads, furnace filter alarms, and pipe insulation wrap. Some recipients didn't like the showerheads and kitchen faucet aerators because they did not fit or the water pressure was too low after installation.

School-Based Delivery Channel Kit Tracking

Ameren Missouri designed the program such that each classroom received a kit for each student, with one extra for the teacher. Teacher interviews and the number of student HEW's returned by students indicate that additional kits may have been provided. Cadmus assumed the measures were installed and utilized at the same rate as the intended kits and did not adjust the number of kits counted toward the program.

CSR Process Evaluation Requirements

As previously mentioned, the Missouri CSR requires that demand-side programs that are part of a utility's preferred resource plan are subject to ongoing process and impact evaluations that meet certain criteria. Process evaluations must address, at a minimum, the five questions listed in Table 5. The table provides a summary response for each specified CSR process requirement. We previously offered a summary of the data used to meet with impact CSR requirements in Table 4.

Table 5. Summary Responses to CSR Process Evaluation Requirements

CSR Requirement Number	CSR Requirement Description	Summary Response
1	What are the primary market imperfections common to the target market segment?	For the school-based kit delivery channel, the primary market imperfection common to the target market was inadequate information and/or knowledge regarding the energy saving benefits of high-efficiency household items provided through the school kits. For the multifamily kit delivery channel the market imperfection is the possible disconnect between the person paying the electricity bill and the person receiving the energy savings benefit from installing high-efficiency household items provided through the multifamily kit. For example, if a multifamily property resident doesn't pay their own electricity bill, they have less incentive to install the high-efficiency household items because they don't realize the energy savings. For another example, if a resident pays their own electricity bills, the property manager has less incentive to install high-efficiency household items (again, as they do not realize the energy savings).

CSR Requirement Number	CSR Requirement Description	Summary Response
2	Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?	The school-based delivery channel and the multifamily delivery channel's target market segments are appropriately defined. The target market segment for school-based delivery channel is schools within Ameren Missouri's service territory. The target market segment for multifamily delivery channel is Ameren Missouri customers living in multifamily units with electric water heating. The educational component of the school-based delivery channel is designed to lessen the market imperfection of inadequate information or knowledge regarding the energy savings benefits of high-efficiency household items. This added benefit of the school-based delivery channel outweighs the fact that **s**chool kits cannot be limited to customers of Ameren Missouri with electric water heating.
3	Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	Cadmus compared the school-based kit delivery channel and the multifamily kit delivery channel to similar utility programs to establish whether the kit contents represented standard practice or if other measures could be considered. For the multifamily delivery channel, all four benchmarked programs offered CFL light bulbs, showerheads, and kitchen and bathroom aerators to multifamily units. Compared to other programs, Ameren Missouri's multifamily kit delivery channel contained most of the common measures provided by utilities, along with measures not typically offered by other similar programs (e.g., LED light bulbs, pipe wrap). The Ameren Missouri school kits included a range of lightweight measures that students could bring home and easily install. All programs included in the benchmarking offered showerheads, aerators, and LED or CFL light bulbs to students and their families. Compared to five other school kit programs, Ameren Missouri's school kits contained all of the most common measures (e.g., light bulbs, showerheads, aerators, a filter alarm), except for an LED night light, which five other benchmarked programs offered.

CSR Requirement Number	CSR Requirement Description	Summary Response
4	Are the communication channels and delivery mechanisms appropriate for the target market segment?	For school kits, communication flowed to and from Ameren Missouri, the implementers (ICF and NEF), school administrators and teachers, and students and families. Communication between these groups was clear and appropriate for the delivery channel. For the multifamily kits communication flowed to and from Ameren Missouri, the implementer ICF, the property managers, and their tenants. Cadmus did not assess this communication channel in PY16, due to the later program startup.
5	What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	For the school delivery channel, the evaluation analysis found that while Ameren Missouri's kit installation rates were among the highest of benchmarked peer programs, some households need additional installation instructions, the opportunity to return unused products, and suggestions for alternative options if the product doesn't fit the household's equipment. For the multifamily delivery channel the team did not perform this assessment in PY16, due to the later program startup.

Key Conclusions and Recommendations

The Energy Efficiency Kits program successfully launched a new, school-based delivery channel in PY16. This is evidenced by how quickly schools signed up to receive school kits and the enthusiasm for the delivery channel expressed by surveyed families and interviewed teachers. Cadmus offers the following conclusions and recommendations for improving the program.

Conclusion 1. Teachers influence student's completion of the Home Energy Worksheet (HEW). Teachers who required students to return the HEW for credit or who made the HEW an extra credit assignment achieved higher return rates in their classrooms, compared with teachers who did not offer incentives for completing HEWs.

Recommendation 1. Encourage teachers to integrate completion of the HEW into their curriculum. Providing examples of how other teachers have successfully encouraged completion of the HEW may be helpful to other teachers.

Conclusion 2. Teacher interviews and participant surveys found some households had trouble installing certain kit measures such as the efficient showerheads, furnace filter alarms, and pipe insulation wrap.

Recommendation 2. Include clearer instructions on how to install showerheads, furnace filter alarms, and pipe insulation wrap. .

Conclusion 3. Schools can participate once per school year, but allowing schools to participate more often may provide them with more opportunities to engage with the program. An interviewed teacher wished Ameren Missouri offered the program year-round; so she could have participated in spring rather than fall. Participating in the fall forced her to rearrange her lesson plans. Allowing schools to participate more than once per year might provide them with more opportunities to engage with the program.

Recommendation 3. Consider options for allowing teachers to choose between fall or spring participation. In PY17, consider fall and spring kit shipments and the opportunity for schools to participate more than once

Conclusion 4. Participants may not have clearly understood that they could return unused kit items. The schools returned none of the school kit items. Interviewed teachers with additional items gave them to other teachers or classrooms. Two participants surveyed requested a method for returning unused kit items.

Recommendation 4. Allow schools to return unused kit items, and publicize this option to them. Track the number of items and kits returned by school. Extra kits could effectively be redistributed later in fall or spring. Potentially make it easy for participating families and schools to return unused items by providing a box with a return shipping label for unused items to each school that could be kept at a central location.

Conclusion 5. School kits are inevitably distributed to non-Ameren Missouri customers. Because it is problematic to verify student account information prior to school kit delivery, some school kits are distributed to non-Ameren Missouri homes.

Recommendation 5. Consider partnering with a gas or water utility to distribute school kit costs. Partnering with another utility would help mitigate costs of school kits which are inevitably distributed to non-Ameren Missouri customers.

Conclusion 6. Energy Efficiency Kits program marketing material included visual elements that could be improved and the material did not always adhere to the overall Ameren Missouri branding guidelines. Cadmus found that marketing materials for both school-based and multifamily delivery channels follow best practices, however some visual elements could be improved. The team found the fall e-mail to school invite confusing, with colors and formats inconsistent with other Ameren Missouri branding. The team also found that a brochure and tenant door hanger, both for the multifamily kits, slightly differed from other Ameren-branded materials reviewed; specifically, they used a different the font type and spacing.

Recommendation 6. Ensure all marketing material matches Ameren Missouri branding.

PY15 Recommendation Tracking

The Energy Efficiency Kits program is a new program offered by Ameren Missouri in program years 2016–2018 (PY16–PY18). Cadmus will begin recommendation tracking in PY16.

Introduction

Ameren Missouri engaged Cadmus to perform annual process and impact evaluations of the Energy Efficiency Kits program for a three-year period, from 2016 through 2018. This annual report covers the impact and process evaluation findings for Program Year 2016 (PY16), the period from March 1, 2016, through February 28, 2017—the first year of the three-year program cycle.

Program Description

In PY16, the program provided energy efficiency kits through two separate delivery channels, as described below.

School-based delivery channel. This delivery channel was implemented for the first time in PY16. Participating teachers received classroom curriculum and energy-saving school kits (school kits) to distribute to their students. Each school kit contained: one energy-efficient showerhead; one energy-efficient kitchen faucet aerator; one energy-efficient bathroom faucet aerator; furnace filter alarm; three feet of water heater pipe wrap; and four LEDs.

Multifamily delivery channel. The Efficient Products program offered this delivery channel prior to introduction of the Energy Efficient Kits program in PY15, although startup of the PY16 program was delayed until February 2017 and only one property manager participated. The channel provided energy-saving kits (multifamily kits) to property managers of eligible multifamily homes. To qualify, properties had to have three or more rental units and must have electric water heaters. Property managers (or staff) installed multifamily kit items in each property's units. Multifamily kits contained one energy-efficient showerhead, one energy-efficient kitchen faucet aerator, one energy-efficient bathroom faucet aerator, one furnace filter alarm, six feet of water heater pipe wrap, and four LEDs. However, in PY16, Ameren Missouri did not distribute showerheads and furnace filter alarms as part of the multifamily delivery channel because only one property participated that did not require these items.

Table 6 shows the kit items by delivery channel.

Table 6. PY16 Energy Kit Contents

Measure	School Kit Quantity	Multifamily Kit Quantity
Energy-Efficient Showerhead	1	1
Energy-Efficient Kitchen Faucet Aerator	1	1
Energy-Efficient Bathroom Faucet Aerator	1	1
LEDs	4 bulbs	4 bulbs
Water Heater Pipe Wrap*	3 feet	6 feet
Furnace Filter Alarm	1	1

*Each school kit contained 3 feet of pipe wrap, and each multifamily kit contained 6 feet.

For PY16–18, Ameren contracted with ICF International (ICF) to implement the program. ICF implements both the multifamily and school-based delivery channels, with support from National Energy Foundation

(NEF) for delivery of the school-based delivery channel. For the multifamily kit delivery channel, ICF created the property manager marketing material and collateral for tenants; delivered and tracked multifamily kit items and program materials; and managed property manager eligibility and enrollment. For the school-based delivery channel NEF developed the school kit curriculum; built program awareness through eligible schools; delivered and tracked school kits and program materials, enrolled teachers, and conducted day-to-day management. NEF wrote the curriculum materials at a sixth-grade level and confirmed their appropriateness with the Missouri Department of Education.

Program Activity

In PY16, the Energy Efficiency Kits program delivered a total of 16,245 school kits and 82 multifamily kits (to one property manager), distributing a total of 179,679 energy efficiency products to Ameren Missouri participants, as shown in Table 7. For the multifamily kit delivery channel, the participating property manager received energy-efficient showerheads and furnace filter alarms, but these were returned to Ameren Missouri. Consequently, the program did not claim savings for them in PY16.

Table 7. PY16 Energy Efficiency Kits Program Activity

Measure	PY16 Totals
School Kits	
Energy-Efficient Showerhead	16,245
Energy-Efficient Kitchen Faucet Aerator	16,245
Energy-Efficient Bathroom Faucet Aerator	16,245
LEDs	64,980
Water Heater Pipe Wrap	48,735
Furnace Filter Alarm	16,245
Subtotal	**178,695**
Multifamily Kits	
Energy-Efficient Showerhead	-
Energy-Efficient Kitchen Faucet Aerator	82
Energy-Efficient Bathroom Faucet Aerator	82
LEDs	328
Water Heater Pipe Wrap	492
Furnace Filter Alarm	-
Subtotal	**984**
Total	**179,679**

Evaluation Methodology

In evaluating Ameren Missouri's Energy Efficiency Kits program, Cadmus identified the following objectives for PY16.

Impact Evaluation Priorities

- Verify program tracking data
- Verify the number of installations to calculate gross energy and demand impacts
- Estimate net-to-gross (NTG) estimates, including spillover
- Assess coincident peak net demand savings using Ameren Missouri's load shapes and estimation method

Process Evaluation Priorities

- Assess customers' satisfaction levels and participation motivations
- Research successful marketing strategies used to target multifamily properties and schools
- Assess program design and implementation, and identify opportunities for improvements in customer satisfaction and marketing
- Track changes in key progress indicators, including awareness changes
- Assess how well the educational information and energy-savings opportunities were understood

Table 8 lists evaluation activities and briefly explains the purpose of each of these. Descriptions of each activity follow the table.

Table 8. PY16 Process and Impact Evaluation Activities and Rationale

Evaluation Activity	Process	Impact	Rationale
Data Tracking Review		✓	Cadmus reviewed the program tracking data recorded in the Vision database to determine the data's completeness and to identify any variables necessary for impact calculations.
Engineering Analysis		✓	Cadmus estimated measure-specific savings using a set of algorithms and inputs.
Estimate NTG		✓	Cadmus estimated NTG to determine the portion of gross energy savings influenced by and attributable to the Energy Efficiency Kits program, free of other influences.
Stakeholder Interviews	✓		Cadmus interviewed program managers and implementers to understand their perspectives on program effectiveness.
School Administration Interviews	✓		Cadmus interviewed school administrators, including teachers, to gain insights into program delivery and program effectiveness.

Evaluation Activity	Process	Impact	Rationale
Property Manager Surveys	N/A	N/A	For the multifamily kit delivery channel, Cadmus did not survey the property manager due to the low participation.
Student Family Participant Surveys	✓	✓	For the school-based delivery channel, Cadmus surveyed student family participants that received school kits.
Nonparticipant Spillover		✓	Cadmus estimated nonparticipant spillover (NPSO) using a cross-cutting general population survey.
Marketing Review	✓		Cadmus identified gaps and opportunities in Ameren Missouri's Energy Efficiency Kits program marketing materials.
Benchmarking	✓	✓	Cadmus benchmarked Ameren Missouri's Energy Efficiency Program against similar programs to assess the program design and implementation, and to identify opportunities for program delivery improvements.
Track key progress indicators	✓	✓	Cadmus developed a number of key progress indicators to track each program year.
Cost-Effectiveness Review		✓	Ameren Missouri determined the Energy Efficiency Kits program's cost-effectiveness.

Data Tracking Review

Cadmus reviewed the program tracking data, recorded in the Vision database, to determine completeness and to identify variables necessary for impact calculations. The team received final school-based delivery channel and multifamily delivery channel Vision data in March 2017.

Engineering Analysis

To estimate per-unit gross savings for each Energy Efficiency Kit program measure, Cadmus used engineering algorithms, assumptions, and all available Ameren Missouri- and participant-specific inputs. This report's Gross Impact Evaluation Results section presents each algorithm and input assumption.

Stakeholder Interviews

In December 2016, Cadmus interviewed program stakeholders to gather information on program design and planned changes, identify challenges encountered by program staff or implementers; and determine appropriate solutions.

As shown in Table 9, the team spoke with five Ameren Missouri program stakeholders and two program implementers; Appendix D provides the stakeholder interview guide.

Table 9. PY15 Completed Stakeholder Interviews

Stakeholder Group	Interviews Conducted
Ameren Missouri Program Management	2
ICF International Management	1
National Energy Foundation Management	2
Total	**5**

Throughout PY16, the team regularly spoke with Ameren Missouri program staff to discuss program operations and to coordinate evaluation activities.

School Administration Interviews

In February 2017, Cadmus interviewed eight teachers to understand their motivations for participation in and awareness of the program, and to solicit suggestions about how to improve the program's implementation and content. Appendix E provides the interview guide. The team sent email invitations to all teachers and school administrators with valid email addresses to contribute feedback via interviews (n=220), of which eight volunteered to participate.

The team hoped to interview one or two teachers who did not turn in HEWs to Ameren Missouri along with one school administrator. About 45% of teachers, met the goal to have at least 80% of their students complete HEWs. Of the remaining 55% of teachers not meeting the goal, more than half (29%) did not complete HEWs. Ultimately, no administrators responded to the team's request for feedback. In addition, the team received responses from only four teachers who did not turn in HEWs. Among these responses, only two accepted the team's invitation for an interview, and the team successfully scheduled an interview with only one of them.

Participant Surveys

In PY16, Cadmus conducted an online survey of participating families who received the school kit (shown in Appendix E). The survey covered topics for the impact evaluation and the process evaluation, including measure verification, free ridership, spillover, participant awareness and decision-making, and satisfaction.

The team fielded the survey in February to early March 2017. As ICF included an HEW in the school kits that requested the contact information, the team timed the survey for 16 weeks after students received school kits. The survey asked participants how many school kit items they installed, their satisfaction with the program, and questions about the participant's home, including the number of occupants. To avoid duplications of effort, the online survey did not ask for information already gathered by ICF on HEWs.

Table 10. Participant Survey Summary

Target Audience	Survey Method	Field dates	Population	Completed Surveys
School Kit Participants	Online	March—February 2017	3,227*	404
*Cadmus surveyed all participants with a valid email address and that received one kit.				

The team's review of the customer data subset for the student family school kits survey found a very small number of kits going to the same households (n=35), though the team did not adjust for these kits. As the team had to have email addresses to deliver the survey, the evaluation offered six $100 drawings for participants who provided their email address on the HEW returned by each school.

In PY16, the team did not survey the one participating property manager. When the team developed the survey schedule in December 2016, property managers had not yet received multifamily kits. As of January 2017, the multifamily kits delivery channel scheduled three properties to receive kits in late February or early March 2017, and one property that had received kits and was installing measures. The tracking data showed the one participating property manager had received items totaling 82 multifamily kits.

Non-Participant Surveys

Cadmus conducted telephone surveys with 200 Ameren Missouri customers who did not participate in any of Ameren Missouri's energy efficiency programs. Cadmus conducted the surveys in order to calculate non-participant spillover (NPSO). In order to conduct the surveys, Cadmus drew a random sample of 20,000 Ameren Missouri customers and called through the sample until we reached our quota of 200 non-participant customers. The team asked respondents if they had adopted energy efficiency measures and about the influence of Ameren Missouri's efficiency program marketing campaign on their decision to adopt the measures.

Marketing Review

Cadmus completed a strategy assessment and marketing materials review to assess the Energy Efficiency Kits program's adherence to industry best practices for program marketing strategies and related marketing tactics. In conducting this review, the team examined seven pieces of marketing materials for both the school kit and multifamily delivery channels.

Benchmarking

Cadmus selected four multifamily kit programs and five school kit programs to compare with Ameren Missouri's Energy Efficiency Kits Program. The Team conducted secondary research using its benchmarking database and publicly available information to identify which programs had the most

recent available evaluations and contained information regarding metrics and topics planned for benchmarking.

For the school-based delivery channel benchmarking research compared the following:

- Kit contents
- Measure installation rates
- Program participation
- Ex post per-kit savings (kWh)
- Ex post per-kit savings (kW)

For the multifamily delivery channel benchmarking research compared the following:

- Kit contents
- Program participation

Key Progress Indicators

Cadmus plans to track the following key progress indicators for the Energy Efficiency Kits program: program year electric savings, the number of energy efficiency kit recipients and recipients' satisfaction with energy efficiency kits and Ameren Missouri. In the PY17 evaluation, the team will compare these key progress indicators to new results and report any findings.

Cost-Effectiveness

Using final PY16 Heating and Cooling Program participation and implementation data as well as *ex post* gross and net savings estimates presented in this report, Ameren Missouri determined the program's cost-effectiveness using DSMore (a financial analysis tool designed to evaluate the costs, benefits, and risks of DSM programs and services). As shown in the Cost-Effectiveness Results section, Ameren Missouri assessed cost-effectiveness using all five standard perspectives produced by DSMore:

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

Process Evaluation Findings

This section presents Cadmus' process evaluation findings, organized in five sections: program design, program delivery, marketing and outreach, teacher interviews, and student family survey results.

Program Design

The Energy Efficiency Kits program's design seeks energy savings through promotion of energy efficiency awareness and installation of household energy saving products through two distinct delivery channels: school-based and multifamily.

The school-based delivery channel seeks long-term energy savings by increasing awareness of energy efficiency among youth within Ameren Missouri's service territory. To do so, the program distributes energy efficiency curriculum and kits. This delivery channel centers on the concept that educating young people about the benefits of saving energy will result in long term behaviors that reduce consumption. Ameren Missouri's primary means of engendering these subtle yet significant behavioral changes is a specific curriculum, correlated to Missouri state standards. Installing and monitoring new energy efficiency kit items helps to reinforce the curriculum.

Participating sixth-grade teachers taught the energy efficiency curriculum and distributed kits to their students. At home, students—with their families' help—installed the kit measures. Following kit measure installation, students and their families answered questions on a HEW, either through a form that they returned to their teachers or online at AmerenMissouri.com/education.

If a family completed the form online, they received a confirmation code to put on the paper forms, and were asked to return the form to their teachers. To encourage worksheet completion, teachers who sent in at least 80% of their classroom's HEW data received a $50 gift card, on the program's behalf. For completing the form, students received a Think! Talk! Take Action! wristband.

The multifamily delivery channel sought to achieve long-term energy savings by increasing multifamily property managers' awareness of low-cost energy efficiency items. Energy-saving items were distributed to multifamily properties and directly installed by the properties' facility managers. The program distributed one kit's worth of items for each eligible market rate unit. Eligible participants included Ameren Missouri electric account holders, who own and manage non-low-income multifamily properties with three or more rental units using electric water heaters. This delivery channel was originally offered and evaluated through the 2013-2015 Efficient Products Program.

As shown in Table 11, each kit supplied every participating student and teacher and eligible multifamily unit with the following program measures.

Table 11. PY16 Energy Kit Contents

Measure	School Kit Quantity	Multifamily Kit Quantity
Energy-Efficient Showerhead	1	1
Energy-Efficient Kitchen Faucet Aerator	1	1
Energy-Efficient Bathroom Faucet Aerator	1	1
LEDs	4 bulbs	4 bulbs
Water Heater Pipe Wrap	3 feet	6 feet
Furnace Filter Alarm	1	1
Pipe Wrap*	3 feet	6 feet

*Each school kit contained 3 feet of pipe wrap; each multifamily kit contained 6 feet.

As shown in Table 12, the kits included supplemental material, which varied by delivery channel.

Table 12. PY16 Energy Kit Supplemental Materials by Delivery Channel

School Kit	Multifamily Kit
Teacher materials: • Teacher Guide • DVD • Posters • Program Evaluation • Rewarding Results flier Student materials: • Student Guide • Parent letter • HEW • *Think! Talk! Take Action* wristbands	• Door hanger • Pre- and post-installation letters

Program Delivery

This section discusses responses that program staff and implementers supplied during Cadmus' interviews primarily focused on roles and responsibilities, program implementation, program changes, delivery successes and program achievements, program implementation challenges, and potential changes for PY17.

Roles and Responsibilities

Ameren Missouri program staff provide overall strategic direction and program management, and oversee evaluation activities. ICF tracks program data and regular program reporting to Ameren Missouri staff.

In PY16, ICF implemented the multifamily and school-based delivery channels, with NEF's support for delivering the school-based delivery channel. For the multifamily kit delivery channel, ICF accomplished the following:

- Created the property manager marketing material and collateral for tenants
- Delivered and tracked multifamily kit items and program material
- Managed property manager eligibility and enrollment

For the school-based delivery channel, NEF developed the school kit curriculum, built eligible schools' awareness of the program, and delivered and tracked school kits and program materials, teacher enrollment, and day-to-day management. NEF wrote the curriculum materials for a sixth-grade level and confirmed their appropriateness with the Missouri Department of Education.

Program Implementation

For PY16, Ameren Missouri program staff reported the kit distribution goal as 16,000 school kits and 10,000 multifamily kits. NEF distributed 16,245 school kits in PY16, surpassing its goal of 16,000 kits. The majority of school kits were sent in October 2016. ICF distributed 82 multifamily kits to one participating property manager in PY16, falling short of their goal to distribute 10,000 multifamily kits. The MEEIA program goal[4] is 91,157 measure installations.

School-Based Delivery Channel Implementation

Customers received the school-based delivery channel well. Program staff remarked on how quickly eligible schools signed up to participate in the program. Not only did the program surpass its participation goals, but NEF implementer staff reported having a waiting list of schools seeking to participate in the program in future years. Implementation staff explained that they had planned additional marketing activities (e.g., sending a postcard to schools advertising the program), but these proved unnecessary due to positive responses from qualified schools.

NEF implementer staff reported receiving positive feedback on the school kit curriculum and program materials from the Missouri Department of Education, parents and guardians (through the home energy worksheet comments), and teachers through the evaluation forms (Cadmus reviewed the look of the evaluation form but did not receive the results of the filled in forms). The Missouri Department of Education plans to apply for the Green Ribbon Schools Award—a federal program, and reported to NEF that they will use Ameren Missouri's school-based delivery channel as an example project in their state. Program staff said NEF paid attention to details such as having a plastic handle on the box to make it easier for children to take their energy efficiency items home. Another example was updating the classroom poster to include Ameren Missouri company values.

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[4] State of Missouri. "In the Matter of Union Electric Company d/b/a Ameren Missouri's 2nd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA." File No. EO-2015-0055. February 5, 2016. Refer to Appendix B.

Ameren Missouri determined which schools could participate in the school-based delivery channel by approving a list of schools within Ameren Missouri's service territory. Due to the design of the school-based delivery channel's design, one cannot solely give kits to solely Ameren Missouri customers that have electric water heaters; instead, implementation staff targets Ameren Missouri customers based on school locations. The program implementer conducted targeted outreach through a combination of direct mail and email to teachers at approved schools. Implementer staff from NEF said program staff were very cautious about which schools qualified. The Cadmus survey found 86% of surveyed participants were Ameren Missouri customers (n=400); 40% had electric water heating (n=383); and 36% had electric space heating (n=392).

For the school-based delivery channel, teachers calculated how many kits they would need, based on numbers of students in their class. When registering online to order kits, the teacher enters this number in the registration site. NEF then confirms the number of school kits with the teacher after confirming the teacher is from an eligible school, and then orders a shipment of kits to be delivered directly to the school.

Through teachers may self-report whether or not their school has too many or too few kits, independent verification of this does not exist. Implementation staff from NEF did not remember receiving requests to return kits from teachers, though, in school kit programs NEF administered for other utilities, if they receive this request from a teacher, they pick up the extra kits. Schools may participate over multiple years, but can only participate once in a school year. Currently, NEF does not track sibling participation to protect the privacy of students; so more than one kit may go to one home.

Multifamily Delivery Channel Implementation

For the multifamily kit delivery channel, program staff reported a slower start to this program, which hurt its ability to meet program goals in PY16. ICF implementation staff admitted a challenge existed in launching the multifamily kit delivery channel at the same time as other programs in the portfolio.

In PY16, the multifamily kit delivery channel was marketed primarily to multifamily property owners, serving as part of the Low Income program. Implementation staff decided the number of multifamily kits needed by a property manager using data collected in the Low Income program through site visits. The Low Income program captured the number of units in a site and how many were low-income or market rate. ICF implementer staff reported marketing multifamily kits through Low Income program, a cost-effective way to reach eligible property managers. Additionally, ICF implementation staff said that property managers prefer to have one point of contact with Ameren Missouri. Program staff agreed, as using this channel created a "one stop shop," where property managers could learn about Ameren Missouri energy efficiency offers to low income units and market rate units without needing to confer with different account managers.

To increase participation in subsequent years the multifamily delivery channel will need to develop relationships with more property managers. Program staff said that ICF began exploring the St Louis Apartment Association as another possible channel for reaching owners of market rate, multifamily

properties in subsequent program years. Program staff and ICF implementation staff both said they expected the program's enrollment pace to increase substantially in subsequent program years.

Implementation staff sent multifamily kit items, totaling one multifamily kit per unit, regardless of the number of bathrooms in each unit. Property managers or their staff then installed the multifamily kit items by an agreed-upon date. An agreement with property managers states that tenants should not install selected items. If there are excess items, implementation staff pick up the excess. In PY16 one property manager received energy-efficient showerheads and furnace filter alarms, but returned these to Ameren Missouri as they could not be installed. In the interview, ICF implementation staff reported that they checked on installation of multifamily kit items by sampling a number of units from each building to check whether installation, at the time of the interview, had yet to happen.

PY16 Program Changes

In PY16, Ameren Missouri discontinued the single-family kits delivery channel, continued the multifamily kits delivery channel, and added the school kits delivery channel. Program staff and ICF implementation staff explained that Ameren Missouri made changes to build relationships with educators (a new customer segment) and market rate property managers (a customer segment where program staff saw demand for energy efficiency programs). Program staff began thinking about a school-based delivery channel when schools requested safety training from Ameren Missouri employees on the dangers of live wires. Program staff then completed a market sizing study and determined that schools would be a beneficial delivery channel.

In addition to changing the delivery channel, Ameren Missouri changed the kit items, based on installation rates in previous evaluations and suggestions from implementation staff. For example, the kit measures did not initially include pipe wrap, but Ameren Missouri chose to include it given its relatively low cost. Program staff said they will review its installation rate to decide whether it should be included in the kit for future program years. Program staff reported that shower timers might be removed from future school kits after one broke in a student's shower. Implementation staff said another alternative would be to include a different shower timer in future kits.

Delivery Successes and Program Achievements

Stakeholders reported that the following program aspects worked particularly well:

- **Positive school kit stakeholder feedback.** Implementer staff from NEF reported receiving positive feedback on the school kit curriculum and program materials from the Missouri Department of Education, parents and guardians (through the home energy worksheet comments), and teachers through their evaluation forms.
- **Surpassing participation goal for the school-based delivery channel.** Not only did the school-based delivery channel surpass its participation goal, but NEF implementer staff reported having a waiting list of schools that sought to participate in the program in subsequent years.

- **Targeting Ameren Missouri customers with electric water heaters to receive school kits**. The Cadmus' team survey found 86% of surveyed participants were Ameren Missouri customers (n=400), and 40% had electric water heating (n=383).

Program Implementation Challenges and Potential Changes

Program stakeholders identified few challenges and areas for future exploration:

- **Slow to launch multifamily kit delivery channel.** Program staff said that having a slower start to the multifamily kit delivery channel hurt its ability to meet program goals in PY16. ICF implementation staff admitted it was a challenge to launch the multifamily kit delivery channel at the same time as other programs in the portfolio.
- **Partner with other utility companies to deliver kits**. Program staff said that partnering with gas and or a water utility is a potential change for the future delivery of this program. Each utility would contribute to the cost of the kits and claim respective electricity, gas or water savings. Program staff mentioned it is a challenge to align program years and budgets with other companies however the partnerships would be mutually beneficial. ICF implementation staff said a partnership with the gas utility would increase the number of eligible multifamily properties and thus number of potential program participants. Program staff similarly said having a gas utility partner would help with targeting of school kits as Ameren Missouri cannot control if a student's home is gas or electric but this partnership would make this point moot.

Marketing and Outreach

Cadmus reviewed the program documentation to better understand the Energy Efficiency Kits program's targeted audience, delivery methods, and eligible measures.

In PY16, program marketing and outreach differed by the two separate delivery channels. To sign up schools for the program, NEF sent a letter to principals on a qualifying schools list and followed up with subsequent emails about the program. NEF reported that the State Department of Education also sent communications about the program to principals targeted for inclusion in the program.

For the multifamily delivery channel: ICF was responsible for raising awareness. In PY16, the implementation staff used a list of property managers, generated by the Low Income program, as an initial list of property managers that owned rental units with electric water heaters. Implementation staff then identified property managers also owning market-rate units and marketed kits to this group.

Energy Efficiency Kits Marketing Material Review

For the Energy Efficiency Kits program, Cadmus reviewed five direct communication materials, including two letters to multifamily residents, and three materials from the school delivery channel: an e-mail, a feedback form, and a letter to school program participants. In addition the team reviewed two pieces of collateral: a brochure and a door hanger, both for multifamily delivery channels. We reviewed these materials in accordance with the "top 10" best practice elements for effective and successful marketing tactics (provided in Table 13).

Table 13. Best Practice Elements for Marketing Materials

Element	Description
Consistent messaging and "look and feel"	Repetition in messaging and consistency in appearance helps to reinforce brand awareness and makes it easier for viewers to understand and remember key program information.
Identifiable target audience	Target audiences become more motivated and engaged if messaging, content, and delivery clearly aim at a program's unique target audience, address key barriers, or leverage distinct motivators.
Clear and comprehensive program details and benefits	Successful communications materials convey benefits in simple terms and explain the value proposition, leading to a higher likelihood of understanding and participating in the program.
Direct call to action	A target more likely follows through with a desired action if that desired action is clearly stated.
Appropriate messaging and creative, given context	Creative layout, design, and messaging should match the marketing and media channel in which material will be placed.
Complementary creative imagery and messaging	An effective and impactful creative platform seamlessly and strategically blends key messaging with imagery and layouts to ensure all components work in concert to encourage the desired outcomes.
Visual appeal	Visually appealing materials leave positive impressions.
Easy participation steps	Effective marketing and communications materials outline a clear, simple, and—ideally—easy path for consumers to follow if participating in a program.
Memorable and recognizable messages	A memorable and recognizable message increases the likelihood of the target recalling the message, and, in turn, increases the likelihood of participation.
QA/QC errors	Materials with errors detract from an organization's credibility.

Cadmus scored the Energy Efficiency Kits program's materials against "top 10" best practice elements, as shown in Table 14. Cadmus assessed each material piece using a four-point scale for each best practice attribute, with a total score annotating the materials' overall adherence to industry best practices in developing marketing tactics. The team applied this scale applied in scoring individual materials, with scores aggregated for different groups.

Table 14. Marketing Material Review Scores

Focus Area	Collateral*	Direct Communication*
Consistent messaging and "look and feel"	3.0	3.1
Identifiable target audience	4.0	4.0
Clear and comprehensive program details and benefits	2.8	3.0
Direct call to action	3.0	3.2
Appropriate messaging and creative, given context	3.5	2.8
Complementary creative imagery and messaging	3.0	3.0
Visual appeal	3.0	2.5
Easy participation steps	3.5	3.2
Memorable and recognizable messages	3.0	2.8
QA/QC errors	No	No

*Scoring methodology: ≤ 1.4: Very Little; 1.5 – 2.4: Somewhat; 2.5 – 3.4: Mostly; ≥ 3.5: With Certainty

The team's analysis of key findings follows, drawn from reviewing Energy Efficiency Kits program marketing materials.

Direct Communication

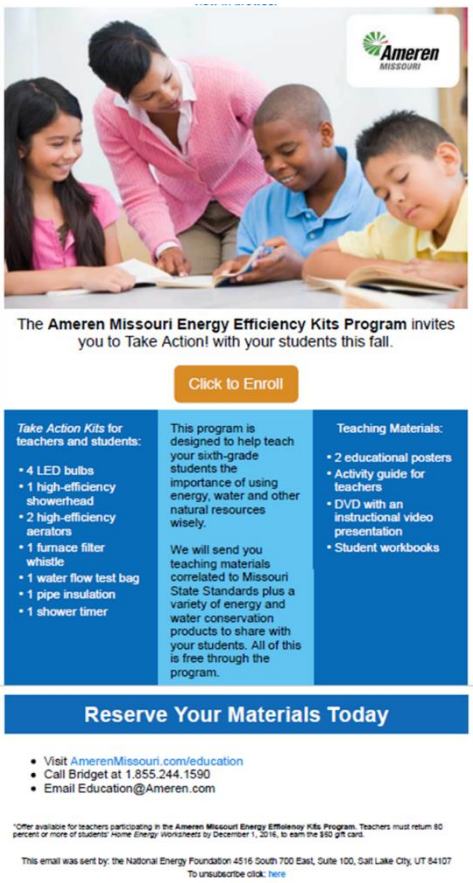
Cadmus reviewed five direct communication materials, including two letters to multifamily residents, and three materials from the school delivery channel: an e-mail, a feedback form, and a letter to school program participants.

Ameren Missouri program staff addressed the letters to customers receiving kits. Pre-install and post-install letters provided explanations of upcoming/installed upgrades in terms easy for customers to comprehend. The team found the post-install letter missed an opportunity to provide additional information on upgrades made, how much energy a resident could save, and other programs that participants might be able to participate in. Including this information would help make connections between these upgrades and other programs, specifically: cross-selling commercial opportunities for residents who may own small businesses.

For the targeted school materials, the e-mail and letter focused on program awareness, while the evaluation form sought to achieve program improvements. Content included within all three materials was well-written and appropriate for the context, providing the right detail level to draw in participants.

Though all materials offered a strong call to action and provided next steps, they could be slightly improved through incorporation of visual design. The team found the e-mail (Figure 1) layout and copy scheme confusing, with colors and formats inconsistent with other Ameren branding. The feedback form, which appears to be in black and white, could be improved by adding color elements. The principal letter also could better illustrate student and teacher benefit sections and could be improved through the text layout.

Figure 1. Fall Invite E-Mail



Collateral

Cadmus reviewed two pieces of collateral for the Energy Efficiency Kits program: a brochure (Figure 2) and a door hanger, both for multifamily delivery channels. These materials used strong visual elements on the front cover, including a relevant image and a clear headline to articulate the material's intended use. The team noticed that these materials slightly differed from other Ameren-branded materials reviewed; specifically, they used a different the font type and spacing.

The materials provided an appropriate detail level. The door hanger focused on elements that customers/renters must know about the upgrade, when it will happen, and what they must do to prepare for it. The property manager brochure focuses on benefits, eligibility, and ways to participate.

While the door hanger makes a good use of space, the brochure includes some large open spaces that it does use effectively. Additional graphics or a smaller-sized brochure could help alleviate wasted space. Though the brochure includes an appropriate detail level about the Energy Efficiency Kits program, other programs listed on the back do not provide sufficient detail on benefits they offer.

Figure 2. Property Manager Brochure Cover

Teacher Interviews

To better understand participants' awareness and motivations and to determine how to improve the program's materials and implementation, Cadmus interviewed teachers who participated in the school-based delivery channel. This section discusses responses from the eight teachers interviewed by the team.

General Feedback

Every teacher whom Cadmus interviewed would (or already did) recommend the program to other teachers and would participate again in the future. One teacher wished she could have participated in spring rather than the fall, as it would have better fit her lesson plans.

Program Awareness and Motivation

Six interviewed teachers learned about the program via email, usually from Ameren Missouri directly. One teacher learned about the program from a student's parent who works for Ameren Missouri, and another learned of it from an Ameren Missouri representative by telephone. When asked how Ameren Missouri could improve program participation, four teachers recommended directly contacting all school administrators or science department chairpersons within the service territory to inform them of the program. Four teachers credited successful recruitment to awareness that arises naturally from teachers talking to one another.

When asked why they participated in the program, all eight teachers communicated a passion for energy efficiency, conservation, and the environment. Some looked forward to interactivity between students and parents; one teacher had "racked her brain" figuring out how to encourage parent

engagement with their students' schoolwork. Another thought the program offered a good way to bring resources to a predominantly low-income community. Each teacher said the mini-grants adequately motivated them to participate, although one said she still would have participated without the incentive. Two teachers reported trying to motivate their students to complete their HEWs by promising to use the mini-grant on a pizza or donut party for the class.

Orders, Delivery, and School Kit Contents

Every teacher interviewed by Cadmus said they ordered one school kit for every student; one teacher mentioned the ordered 10 additional school kits as extras. All kits arrived when scheduled, and teachers expressed satisfaction with delivery times and with scheduling deliveries to align with their lesson plans. Teachers with leftover kits gave them to other teachers, either to distribute to their students or to use personally. They also expressed satisfaction with their NEF liaisons, who effectively addressed any issues and answered all questions.

Students and parents generally did not have difficulty in installing kit items, though one teacher claimed "95%" of parents did not understand how to install the insulation wrap. Another said her students had difficulty installing pipe insulation and furnace filter alarms. She also said the biggest obstacle to success was ensuring the kits made it home with the students. She thinks the program would have been more successful at her school if teachers could have distributed kits directly to parents at a formal function after school hours. Otherwise, students left them in their lockers or had to carry them from class to class.

Curriculum and Materials

The Teacher's Guide proved helpful and was laid out well, and students generally understood the curriculum. Two of the eight teachers said their students had trouble learning about light bulb wattages and how to use them in calculations. One recommended producing a simpler worksheet for that particular lesson. Another teacher said her students had difficulty grasping the concept of hydroelectric power.

The activities included with the kits proved effective, though one teacher skipped an activity because she had trouble understanding how to do it. She said online instructional videos could have helped her remember or better understand the activity should be conducted.

All teachers (but one) played the DVD for their students and considered it effective. Teachers whose students completed the pre- and post-surveys praised the surveys for adequately gauging their students' knowledge of energy efficiency prior to and after the program. One teacher considered the introductory presentation boring, and the pre- and post-surveys not helpful because her students did not complete them properly. Another called the introductory presentation "too childish," although she acknowledged some of her students still liked it.

Teachers liked the educational posters. Some still had them hanging in their classrooms at the time of their interviews, and one stressed how beneficial the posters were to her visual-learner students. One

teacher asked if the information on the backs of the posters could be included as handouts and thought some information would have been better incorporated onto the DVD instead. Two teachers did not like the posters' complexity, with one saying, "Even eighth graders might have trouble understanding them."

Only one teacher interviewed visited Ameren Missouri's website to seek information or to answer questions about the program. The site answered some of her questions; for the remainder, she called her NEF liaison. One teacher recommended the website to her students' parents in case they had questions about kit items.

HEWs

Five teachers interviewed had no difficulty in encouraging their students to complete and return the HEWs. They typically incentivized their students' participation by offering extra credit (or making it a mandatory assignment), using the *Think! Talk! Take Action!* wristbands, and/or motivating them with the $50 mini-grants. One teacher who succeeded in meeting the goal said emailing her students' parents helped her achieve the goal.

One of the three teachers who failed to meet the program's HEW goal recommended shortening the HEWs to prevent losing the students' interest. Another struggled to encourage student participation without offering extra credit or some other reward; not even the possibility of a donut party was incentive enough for her students to participate.

The third teacher—who, among the eight teachers interviewed, was the only one who did not return HEWs—said her school coped with construction and relocation during the program period, and the chaos prevented her from teaching the curriculum as planned.

Student Family Surveys

This section discusses responses from the PY16 online survey of participating families who received the school kit. In PY16, the team did not survey the one participating property manager. To augment the process evaluation, the student family survey covered topics such as satisfaction with the program, kit items, and Ameren Missouri, and gathered data to calculate kit item installation rates, free ridership, and spillover. The team received 404 completed online student family surveys, and omitted blanks, "don't know," and "refused" from the total number of responses. Appendix B provides demographics for the survey respondents.

Satisfaction with Program

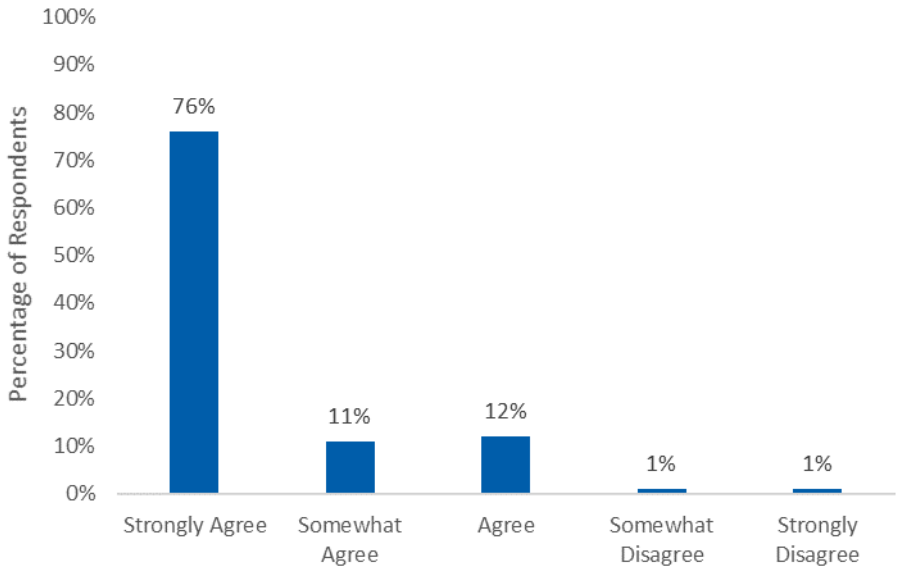
Participating families expressed enthusiasm with the school-based delivery channel. A majority of surveyed families wanted Ameren Missouri's school-based delivery channel continued in local schools (99%, n=397), and the majority of parents surveyed strongly agreed that "[they] are satisfied with [their] child's experience in the Ameren Missouri Energy Efficiency Kits School Program" (76%, n=400).

When asked why they strongly agreed with the statement, parents (n=197) responded as follows:

- 55% said the program helped inform their children about energy efficiency through a positive learning experience
- 15% said their child became enthusiastic about the program
- 7% were pleased with the kit contents
- 6% said the program helped their family save energy and money
- 6% believed it was a good program
- 1% believe in conservation and environmental issues

Very few respondents expressed negative feedback. Of respondents providing lower satisfaction scores, nine said they could not use some kit contents, four found the instructions confusing or thought the teachers lacked involvement in the program, and one said they received defective equipment.

Figure 3. Satisfaction with Energy Efficiency School Kits Program*

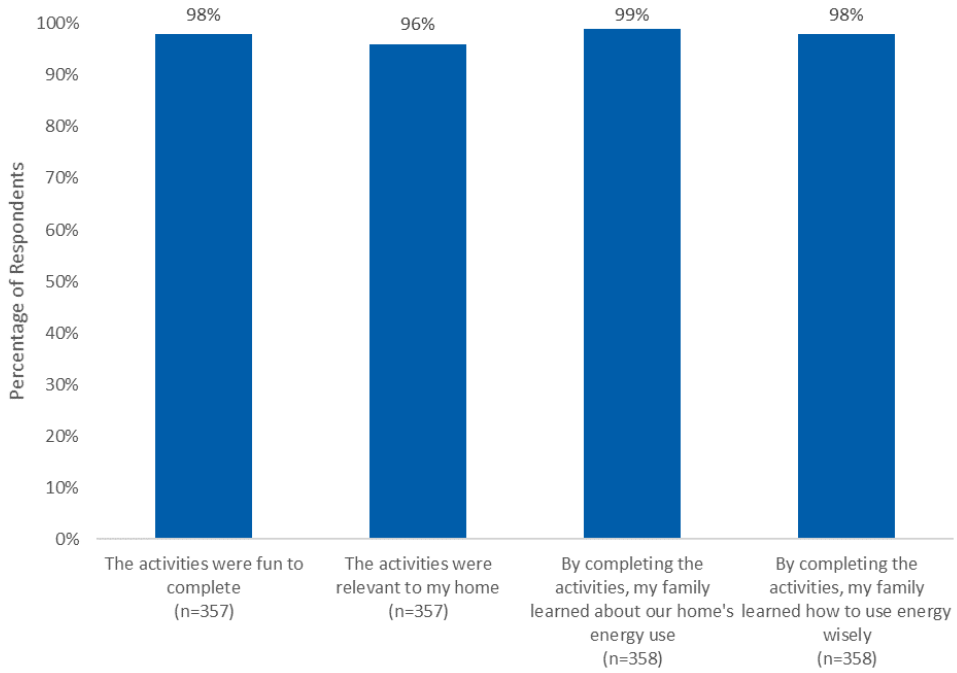


Survey question: B1. "For the following statement, check the box that corresponds with whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the following statement: "I am satisfied with my child's experience in the Ameren Missouri Energy Efficiency Kits Program." n=400
*Responses shown do not sum to 100% due to rounding

Educational Component

As shown in Table 12, the school kits included supplemental material for both the teachers and the students. The students received a Student Guide with their kit. The majority of participating families remembered completing activities in the Student Guide (90%, n=403), and, as shown in Figure 4, either strongly or somewhat agreed that activities in the Student Guide taught them about their household's energy use (99%, n=358), were fun to complete (98%, n=357), taught them about using energy wisely (98%, n=358) and were relevant to their homes (96%, n=357).

Figure 4. Feedback on Student Guide Activities



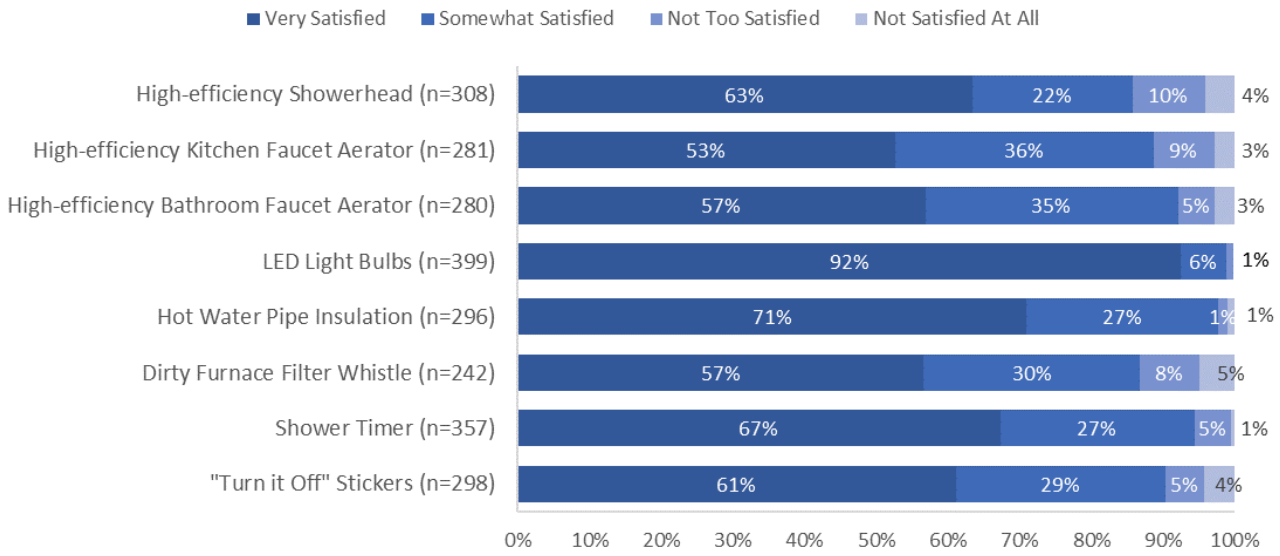
Survey question: B5. "For the following statements please check the box that corresponds with whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the following statements…" (Multiple responses allowed) (Total n=1,430)

Measure Satisfaction

We asked home energy kit participants about their experiences with the various kit devices. Figure 5 shows participant satisfaction with each energy efficiency school kit item. Two items—LED light bulbs and hot water pipe insulation—received the highest satisfaction levels among participants, with 98% (n=399) and 98% (n=296)[5] of respondents, respectively, reporting they were *very satisfied* or *somewhat satisfied* with these measures. Respondents were less enthusiastic about the high-efficiency showerhead, with only 86% giving a response of *very satisfied* or *somewhat satisfied* (n=308).

[5] Sample sizes differed because questions regarding satisfaction about measures were only asked of participants who installed measures.

Figure 5. Satisfaction with Kit Measures*



Survey question: B9. "For each Energy Efficiency Kit item below, select a rating [very satisfied, somewhat satisfied, not too satisfied, not satisfied at all] for how satisfied you are with the kit item." (Total n=2,461)
*Responses shown do not sum to 100% due to rounding

Respondents indicating they were "not too satisfied" or "not satisfied at all" with a measure were asked to provide reasons for their dissatisfaction. Table 15 lists the most common reasons cited for dissatisfaction with each kit item, with, across all measures, the most common reason for dissatisfaction across all measures was that the measure did not fit. Additionally, many respondents did not like the low water pressure from the high-efficiency showerheads and aerators.

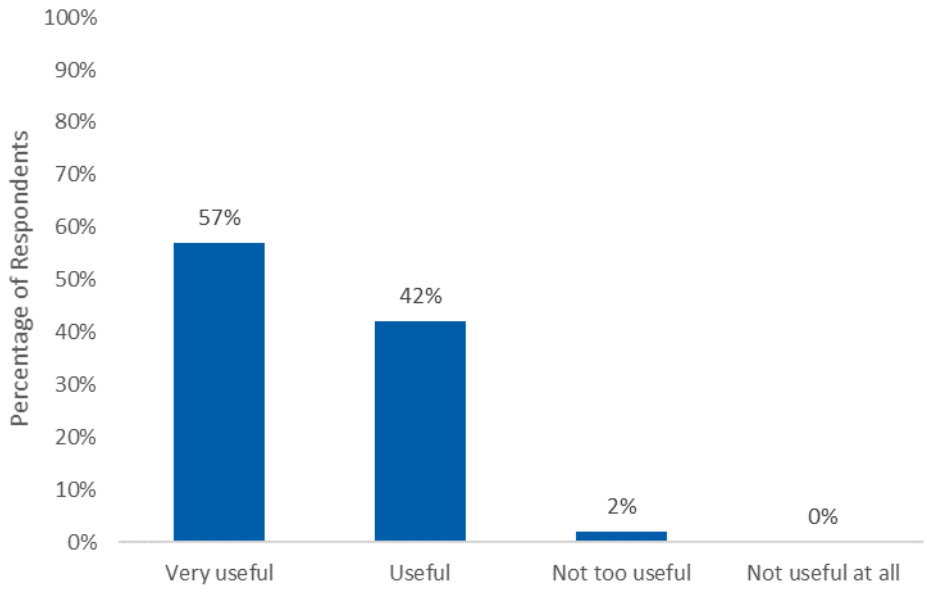
Table 15. Reasons for Dissatisfaction with Kit Measures

Measure	Number of Dissatisfied Respondents	Most Frequent Comment	Second Most Frequent Comment
High-efficiency Showerhead	44 (n=308)	Did not fit	Low water pressure
High-efficiency Kitchen Faucet Aerator	32 (n=281)	Did not fit	Low water pressure
Dirty Furnace Filter Alarm	32 (n=242)	Did not fit	Unsure how to install
"Turn it Off" Stickers	29 (n=298)	Bad appearance	Didn't change habits
High-efficiency Bathroom Faucet Aerator	22 (n=280)	Did not fit	Low water pressure
Shower Timer	20 (n=357)	Couldn't stick to wall	Quickly broke
Hot Water Pipe Insulation	7 (n=296)	Not enough material	Did not fit
LED Light Bulbs	5 (n=399)	Burned out quickly	Did not fit

Kit Instructional Materials

Most respondents (95%, n=404) recalled receiving instructions on how to install items in the kit. The majority thought the instructions were either *very useful* or *somewhat useful,* as shown in Figure 6.

Figure 6. Feedback on Usefulness of Kit Instructions*



Survey question: B7. "How useful did you find the installation instructions that were provided in the kit?" n=384
* Responses shown do not sum to 100% due to rounding

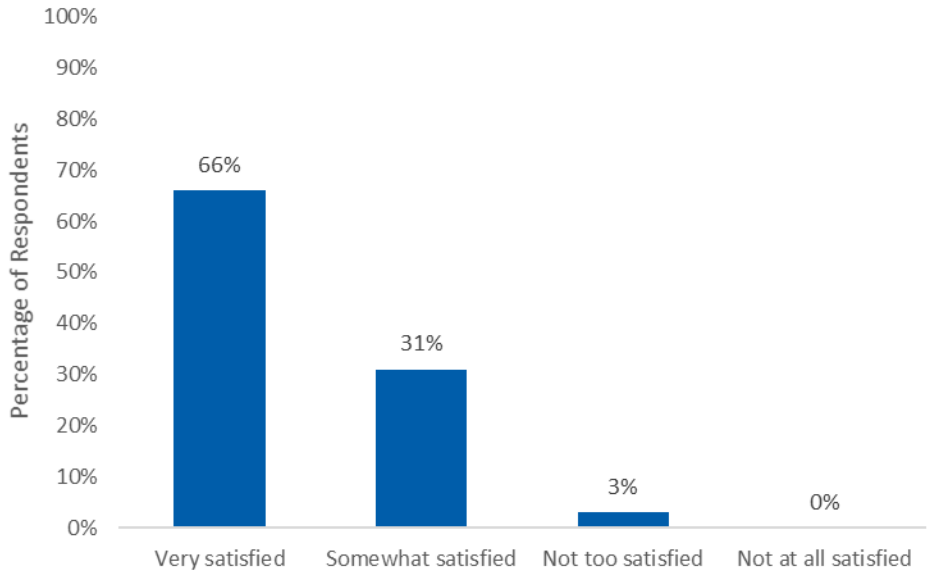
A small number of respondents, perceived the instructions as unhelpful; of this group, two did not need instructions, and three said they were unclear. Of the three saying they were unclear, one said "there were no clear instructions about how to install the filter whistle."

Satisfaction with Ameren Missouri

Cadmus asked school kit recipients about their satisfaction levels with Ameren Missouri as a utility. As shown in Figure 7, the majority of respondents were *very satisfied* with Ameren as an electric provider overall (66%, n=376). While approximately one-third of respondents said they were *somewhat satisfied* (31%), only 3% reported being *not too satisfied* or *not satisfied at all*.

Furthermore, a little over half of respondents said their opinion of Ameren Missouri increased based on their experiences with the program (58%), whereas 41% opinion stayed about the same, and a small percentage—only 1%—said their opinion decreased (n=389).

Figure 7. Satisfaction with Ameren Missouri Overall as a Utility



Survey question: D1. "Thinking about your overall experiences with Ameren Missouri as your utility, how satisfied would you say you are with Ameren Missouri?" n=376

The team asked participants their reasons for satisfaction or dissatisfaction with Ameren Missouri. As shown in Table 16, the biggest satisfaction drivers included the following: reliable and dependable service offered by the utility; Ameren Missouri meeting the customers' expectations as a utility; and positive experiences they had participating in the Energy Efficiency Kits School program. Dissatisfaction drivers included utility rates, the billing process, and customer service.

Table 16. Reasons for Satisfaction or Dissatisfaction with Ameren Missouri

Reasons for Satisfaction	n=128	Reason for Dissatisfaction	n=58
Dependable and/or reliable service	27%	Dissatisfied with utility rates/costs	76%
Satisfied with customer service	17%	Dissatisfied with the billing process	9%
Positive experience with School Kits Program	15%	Dissatisfied with customer service	5%
Ameren Missouri meets expectations as a utility	11%	Dissatisfied with infrastructure and/or maintenance	3%
Positive overall impression of Ameren Missouri	9%	Dissatisfied with outage response	3%
Satisfied with outage response	7%	Dissatisfied with Ameren Missouri's energy sources	2%
Satisfied with utility rates	5%	Rebate processing issues	2%
Ameren promotes energy efficiency	5%	Dissatisfied with service reliability	0%
Only one utility to choose from	2%	Negative overall impression of Ameren Missouri	0%
Incentive or rebate	2%		
Satisfied with infrastructure or maintenance	0%		
Satisfied with billing process	0%		

Suggestions to Improve the Program

As shown in Table 17, Cadmus received 64 suggestions upon surveying participants about actions Ameren Missouri could take to improve the school-based delivery channel.

Table 17. Suggestions to Improve the Energy Efficiency Kits Program

Suggestions	n=64
Unable to install kit measure in home	23%
Continue offering the program	16%
Provide better instructions to students/family	13%
Have options for returning unused measures/already had kit measures installed in homes	13%
Provide better instructions to students/family	13%
Defective equipment in kit/didn't like kit measure	6%
Include additional measures in kit	6%
Offer additional energy efficiency lessons in classroom	5%
Focus more on electric savings rather than water usage	3%
Provide additional information on ways to save energy	3%

Cadmus received 15 responses (23%, n=64) regarding incompatible school kit items, with all responses reporting one or all water savings measures did not fit their home fixtures; in addition, two respondents could not install the furnace filter alarm.

The team received 10 responses from enthusiastic parents that wanted to see the program continued in their children's school and in other schools. Cadmus received eight suggestions to provide better instructions to students and family, and eight suggestions to have an option for families to return unused items.

The eight suggestions to provide better instructions included four regarding providing clearer installation instructions, with two of the four saying additional information on how to install the furnace filter alarm would be welcomed. Three of the eight suggestions came from parents wanting more information about the program; they felt they did not know the school kit would be coming home with their student.

Although the installation materials directed parents and teachers to online installation videos, some were not aware of them. The last of the eight suggestions addressed receiving installation instructions as a video walk-through of the kit, where the families, via YouTube, could watch how to install the items prior to their actual installation.

Gross Impact Evaluation Results

This section details Cadmus's determination of each measure's installation rate and calculations of per-unit savings for Ameren Missouri's Energy Efficiency Kits program.

Measure Installation Verification

This section includes the installation rates of energy efficiency kit items, as shown in Table 18. The school installation rates derive from PY16 student family surveys, which Cadmus fielded in late February to early March. The multifamily installation rates come from the PY15 evaluation as the team did not conduct multifamily participant surveys for PY16 due to low PY16 participation.

Table 18. Measure Installation

Delivery Channel and Measure	Percentage Installed and Operating
School Kit	
Energy-Efficient Showerhead	65%
Energy-Efficient Kitchen Faucet Aerator	53%
Energy-Efficient Bathroom Faucet Aerator	57%
LEDs	92%
Water Heater Pipe Wrap	74%
Furnace Filter Alarm	47%
Multifamily Kit	
Energy-Efficient Showerhead	-
Energy-Efficient Kitchen Faucet Aerator	100%
Energy-Efficient Bathroom Faucet Aerator	100%
LEDs	98%
Water Heater Pipe Wrap	100%
Furnace Filter Alarm	-

For the school-based delivery channel, the team used PY16 survey results to make adjustments to the gross savings, as shown in Table 19. School savings were adjusted using inputs from the surveys to account for the percentage of survey respondents that were Ameren Missouri customers and used electric water heating (see Appendix B). In addition, LED savings are adjusted using the Uniform Methods Project methodology to account for bulbs not installed immediately but installed in subsequent years.[6]

[6] Uniform Methods Project, Chapter 21: Residential Lighting, Published February 2015

Table 19. Saturation Adjustments

Delivery Channel and Measure	Electric Water Heating Saturation	Ameren Missouri Customers
School Kit		
Energy-Efficient Showerhead	40%	86%
Energy-Efficient Kitchen Faucet Aerator	40%	86%
Energy-Efficient Bathroom Faucet Aerator	40%	86%
LEDs	100%	86%
Water Heater Pipe Wrap	40%	86%
Furnace Filter Alarm	100%	86%
Multifamily Kit		
Energy-Efficient Kitchen Faucet Aerator	100%	100%
Energy-Efficient Bathroom Faucet Aerator	100%	100%
LEDs	100%	100%
Water Heater Pipe Wrap	100%	100%

Measure-Specific Gross Savings

Cadmus estimated gross savings for most program measures using the engineering algorithms established in the Energy Efficiency Kits Evaluation Plan and repeated in the following sections.[7] For the furnace filter alarm, the team developed an algorithm, using the State of Pennsylvania Technical Reference Manual (TRM),[8] and then compared the resulting values to deemed per-unit savings as provided in Ameren Missouri's 2017 TRM and available through the web-based interface to Cadmus' gross savings estimates.

For each calculation in this section, the team provides a realization rate that compares the "*Ex Ante* Savings/Unit" or the deemed per-unit TRM savings per unit and the "*Ex Post* Savings/Unit," which equals the team's estimated savings per unit. Calculations in this section provide per-unit savings estimates that do not include adjustments for installation rates of kit items or for saturations of applicable electric heating and cooling equipment.

Showerheads

Cadmus estimated energy-efficient showerhead savings using the following algorithm:

$$Energy\ Savings\ \left(\frac{kWh}{Year}\right) = \frac{People \times Shower\ Time \times Days \times \%Days \times \Delta GPM \times (T_{SHOWER} - T_{IN}) \times C_P \times Den}{3{,}413 \times RE \times Showerheads}$$

[7] Cadmus. "Energy Efficiency Kits Evaluation Plan." August 2016.

[8] Public Utilities Commission. *State of Pennsylvania Technical Reference Manual.* 2016. Available online: http://www.puc.pa.gov/pcdocs/1370278.docx

Where:

People	=	Number of people taking showers (ppl/household)
Shower Time	=	Average shower length (min/shower)
Days	=	Number of days per year (day/yr)
%Days	=	Number of showers per day, per person (shower/day-ppl)
ΔGPM	=	Difference in rated gallons per minute for the base showerhead and the new showerhead (gal/min)
T_{SHOWER}	=	Average water temperature at the showerhead (°F)
T_{IN}	=	Average inlet water temperature (°F)
C_P	=	Specific heat of water (Btu/lb-°F)
Den	=	Water density (lbs/gal)
3,413	=	Conversion rate from Btu to kWh (Btu/kWh)
RE	=	Water heater's recovery efficiency
Showerheads	=	Number of showerheads used per home

Table 20 shows inputs for the engineering algorithm used to determine savings from showerheads, delivered both through the school kits and multifamily kits delivery channels. The inputs for the number of people per home and the number of showerheads per home differ between the two delivery channels. For the school delivery channel, Cadmus updated these values based on PY16 survey data; for the multifamily delivery channel, the team used values from the PY15 evaluation.

Table 20. Showerhead Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
People	4.3	PY16 Energy Efficiency Kits School Survey Results	2.07	PY14 Low Income Program Data
Shower Time	7.8	Secondary Source[a]	7.8	Secondary Source[a]
Days	365	Conversion Factor (day/yr)	365	Conversion Factor (day/yr)
%Days	0.6	Secondary Source[b]	0.6	Secondary Source[b]
ΔGPM	0.85	PY16 Program Data[c]	0.85	PY16 Program Data[c]
T_{SHOWER}	105	Illinois TRM[d]	105	Illinois TRM[d]
T_{IN}	61.3	Ameren Missouri 2012 TRM[e]	61.3	Ameren Missouri 2012 TRM[e]
C_P	1	Specific Heat of Water (Btu/lb-°F)	1	Specific Heat of Water (Btu/lb-°F)
Den	8.33	Density (lb/gal)	8.33	Density (lb/gal)
3,413	3,413	Conversion Factor (Btu/kWh)	3,413	Conversion Factor (Btu/kWh)
RE	0.98	Secondary Source[6]	0.98	Secondary Source[6]
Showerheads	2.1	PY16 Energy Efficiency Kits School Survey Results	1.4	PY13 Program Data

[a] Cadmus and Opinion Dynamics Evaluation Team. *Showerhead and Faucet Aerator Meter Study*. Memorandum prepared for Michigan Evaluation Working Group. pp 10. 2013.

[b] Ibid. pp. 11.

[c] The rated gallons per minute for the new showerhead is 1.5 gallons per minute and the rated gallons per minute for the base showerhead is 2.35 and came from the Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0. pp. 184. 2016. Available Online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf

[d] Ibid. pp. 103.

[e] *Ameren Missouri 2012 Technical Resource Manual.* Appendix A. pp. 43. Available online: https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935658483

[f] National Renewable Energy Laboratory, Building America Research. *Recovery efficiency for electric hot water heater.* Benchmark definition, pp. 12. 2009. Available online: http://www.nrel.gov/docs/fy10osti/47246.pdf

Using this engineering algorithm, the team determined an *ex post* energy savings value of 330.5 kWh/year for each showerhead included in a school kit. This value was approximately 182% of the program's *ex ante* value (181.6 kWh/year), as shown in Table 21. The estimates' differences are due to higher than assumed number of people per household and number of showers per home, based on values from Cadmus' survey results.

Table 21. *Ex Ante* and *Ex Post* Comparison for School Kit Showerheads

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
181.6 kWh/yr	330.5 kWh/yr	182%

Kitchen Faucet Aerators

Cadmus evaluated kitchen and bathroom faucet aerators separately. The team estimated per-unit savings for kitchen faucet aerators using the following algorithm:

$$Energy\ Savings\ \left(\frac{kWh}{Year}\right) = \frac{People \times Faucet\ Time \times Days \times \Delta GPM \times (T_{FAUCET} - T_{IN}) \times C_P \times Den\ \times\ DF}{3{,}413 \times RE \times Number\ of\ Faucets}$$

Where:

People	=	Number of people using faucet aerators (people/household)
Faucet Time	=	Average length of faucet use per day (minutes/day/person)
Days	=	Number of days per year (day/yr)
ΔGPM	=	Difference in rated gallons per minute between the base unit and the new unit (gal/min)
ΔT	=	Temperature at the tap minus the temperature at the water main
T_{FAUCET}	=	Average water temperature out of the faucet (°F)
T_{IN}	=	Average inlet water temperature (°F)
C_P	=	Specific water heat (Btu/lb-°F)
Den	=	Water density (lb/gal)
DF	=	Drain factor
3,413	=	Conversion rate from Btu to kWh (Btu/kWh)
RE	=	Water heater's recovery efficiency
Number of faucets	=	Number of used faucets per home

Table 22 shows the engineering algorithm inputs used to determine savings from kitchen faucet aerators, delivered both through the school kits and multifamily kits delivery channels. The inputs for the number of people per home and the number of faucets per home differed between the two delivery channels. For the school delivery channel, Cadmus updated these values based on PY16 survey data; for the multifamily delivery channel, the team used values from the PY15 evaluation.

Table 22. Kitchen Faucet Aerator Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
People	4.3	PY16 Energy Efficiency Kits School Survey Results	2.07	PY14 Low Income Program Data
Faucet Time	4.5	Secondary Source[a]	3.7	Secondary Source[b]
Days	365	Conversion Factor (day/yr)	365	Conversion Factor (day/yr)
ΔGPM	0.7	PY16 Program Data[c]	0.7	PY16 Program Data[c]
T_{FAUCET}	93	Illinois TRM[d]	93	Illinois TRM[d]
T_{IN}	61.3	Ameren Missouri 2012 TRM[e]	61.3	Ameren Missouri 2012 TRM[e]
CP	1	Specific Heat of Water (Btu/lb-°F)	1	Specific Heat of Water (Btu/lb-°F)
Den	8.33	Density (lb/gal)	8.33	Density (lb/gal)
DF	0.75	Drain Factor[e]	0.75	Drain Factor[e]
3,413	3,413	Conversion Factor (Btu/kWh)	3,413	Conversion Factor (Btu/kWh)
RE	0.98	Secondary Source[g]	0.98	Secondary Source[g]
Number of Faucets	1.2	PY16 Energy Efficiency Kits School Survey Results	1	PY13 Program Data

[a] Cadmus and Opinion Dynamics Evaluation Team 2013. pp. 10.b

[b] PY11 MFIQ Metering Study

[c] The rated gallons per minute for the new faucet aerator is 1.5 gallons per minute and the rated gallons per minute for the base faucet aerator is 2.2 gallons per minute, which is the federal rated maximum flow rate for faucets (10CFR430.32 (p) (DOE 1998).

[d] *Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0.* pp. 178. 2016. Available online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf

[e] *Ameren Missouri 2012 Technical Resource Manual.* Appendix A. pp. 43. Available online: https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935658483

[f] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0. pp. 175. 2016. Available online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf

[g] NREL 2009. pp. 12.

Using this engineering algorithm, the team determined an *ex post* energy savings value of 250.1 kWh/year for each kitchen faucet aerator included in a school kit. This value was approximately 314% of the program's *ex ante* value (79.7 kWh/year), as shown in Table 23. The difference between estimates resulted from higher than assumed number of people per household and number of kitchen faucets per home based on survey results.

Table 23. *Ex Ante* and *Ex Post* Comparison for School Kit Kitchen Faucet Aerators

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
79.7 kWh/yr	250.1 kWh/yr	314%

The team determined an *ex post* energy savings value of 115.9 kWh/year for each kitchen faucet aerator included in a multifamily kit. This value was approximately 148% of the program's *ex ante* value (78.3 kWh/year), as shown in Table 24. The difference between estimates resulted from updating the faucet times or the average length of faucet use per day and the number of faucets in the home.

Table 24. *Ex Ante* and *Ex Post* Comparison for Multifamily Kitchen Faucet Aerators

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
78.3 kWh/yr	115.9 kWh/yr	148%

Bathroom Faucet Aerators

The team estimated per-unit savings for bathroom faucet aerators using the following algorithm:

$$Energy\ Savings\ \left(\frac{kWh}{Year}\right) = \frac{People \times Faucet\ Time \times Days \times \Delta GPM \times (T_{FAUCET} - T_{IN}) \times C_P \times Den\ \times\ DF}{3{,}413 \times RE \times Number\ of\ Faucets}$$

Where:

People	=	Number of people using faucet aerators (people/household)
Faucet Time	=	Average length of faucet use per day (minutes/day/person)
Days	=	Number of days per year (day/yr)
ΔGPM	=	Difference in rated gallons per minute between the base unit and the new unit (gal/min)
ΔT	=	Temperature at the tap minus the temperature at the water main
T_{FAUCET}	=	Average water temperature out of the faucet (°F)
T_{IN}	=	Average inlet water temperature (°F)
C_P	=	Specific heat of water (Btu/lb-°F)
Den	=	Water density (lb/gal)
DF	=	Drain Factor
3,413	=	Conversion rate from Btu to kWh (Btu/kWh)
RE	=	Water heater's recovery efficiency
Number of faucets	=	Number of used faucets per home

Table 25 shows the engineering algorithm inputs used to determine savings from bathroom faucet aerators delivered through both the school kits and multifamily kits delivery channels. The inputs for the

number of people per home and the number of faucets per home differed between the two delivery channels. For the school delivery channel, the team updated these values based on PY16 survey data; for the multifamily delivery channel, the team used values from the PY15 evaluation.

Table 25. Bathroom Faucet Aerator Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
People	4.3	PY16 Energy Efficiency Kits School Survey Results	2.07	PY14 Low Income Program Data
Faucet Time	1.6	Secondary Source[a]	1.6	Secondary Source[a]
Days	365	Conversion Factor (day/yr)	365	Conversion Factor (day/yr)
ΔGPM	0.7	PY16 Program Data[b]	0.7	PY13 Program Data[b]
T_{FAUCET}	86	Illinois TRM[c]	86	Illinois TRM [c]
T_{IN}	61.3	Ameren Missouri 2012 TRM[d]	61.3	Ameren Missouri 2012 TRM[d]
CP	1	Specific Heat of Water (Btu/lb-°F)	1	Specific Heat of Water (Btu/lb-oF)
Den	8.33	Density (lb/gal)	8.33	Density (lb/gal)
DF	.9	Drain Factor[e]	.9	Drain Factor[e]
3,413	3,413	Conversion Factor (Btu/kWh)	3,413	Conversion Factor (Btu/kWh)
RE	0.98	Secondary Source[f]	0.98	Secondary Source[f]
Number of Faucets	2.4	PY16 Energy Efficiency Kits School Survey Results	1.4	PY13 Program Data

[a] Cadmus and Opinion Dynamics Evaluation Team. *Showerhead and Faucet Aerator Meter Study*. Memorandum prepared for Michigan Evaluation Working Group. 2013. pp. 10.

[b] The rated gallons per minute for the new faucet aerator will come from the PY16 program data and the rated gallons per minute for the base faucet aerator will be 2.2 gallons per minute, which is the federal rated maximum flow rate for faucets (DOE 1998).

[c] *Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0.* pp. 178. 2016. Available online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf

d *Ameren Missouri 2012 Technical Resource Manual.* Appendix A. pp. 43. Available online: https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935658483

[e] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0. pp. 175. 2016. Available online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf

[f] NREL 2009. pp. 12.

Using this engineering algorithm, the team determined an *ex post* energy savings value of 40.7 kWh/year for each bathroom faucet aerator included in a school kit. This value was approximately

184% of the program's *ex ante* value (22.1 kWh/year), as shown in Table 26. The difference between estimates resulted from higher than assumed number of people per household and number of bathroom faucets per home based on values from the survey results.

Table 26. *Ex Ante* and *Ex Post* Comparison for School Kit Bathroom Faucet Aerators

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
22.1 kWh/yr	40.7 kWh/yr	184%

The team determined an *ex post* energy savings value of 33.5 kWh/year for each bathroom faucet aerator included in a multifamily kit. This value was approximately 88% of the program's *ex ante* value (38 kWh/year), as shown in Table 27. The difference between estimates resulted from updating the number of bathroom faucets in the home.

Table 27. *Ex Ante* and *Ex Post* Comparison for Multifamily Bathroom Faucet Aerators

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
38 kWh/yr	33.5 kWh/yr	88%

LEDs

Cadmus estimated per-unit savings for LEDs using the following algorithm:

$$Energy\ Savings\ (kWh/Year) = \frac{(Watt_{Base} - Watt_{EE}) \times Hours_{RES} \times Days}{1{,}000} \times WHF$$

Where:

$Watt_{Base}$	=	Wattage of the original incandescent bulb replaced by LED
WattEE	=	Wattage of new LED installed
$Hours_{RES}$	=	Average hours of use per day
Days	=	Days used per year
1,000	=	The conversion factor from Wh to kWh
WHF	=	Waste heat factor (to account for interactive effects)

Table 28 provides assumptions for LED savings. The team will use the same engineering algorithm and inputs for school and multifamily kits.

Table 28. LED Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
$Watts_{Base}$	43	The lumen-equivalent halogen wattage for LEDs	43	The lumen-equivalent halogen wattage for LEDs
$Watts_{EE}$	9	9-watt ENERGY STAR LEDs with 800 lumen output.	9	9-watt ENERGY STAR LEDs with 800 lumen output
$Hours_{RES}$	3.15	2014 light metering study, adjusted for room-level saturation from the PY10 home inventory	3.15	2014 light metering study, adjusted for room-level saturation from the PY10 home inventory
Days	365	Conversion Factor (day/yr)	365	Conversion Factor (day/yr)
1,000	1,000	Conversion Factor (Wh/kWh)	1,000	Conversion Factor (Wh/kWh)
WHF	0.97	PY16 Engineering Simulation Modeling adjusted for heating and cooling saturations	0.97	PY16 Engineering Simulation Modeling adjusted for heating and cooling saturation

Using this engineering algorithm, the team determined an *ex post* energy savings value of 37.3 kWh/year for each LED bulb distributed in the school and multifamily kits. This value was approximately 99% of the program's *ex ante* value (37.7 kWh/year), as shown in Table 29. The difference between estimates resulted from the team updating the WHF using PY16 survey results.

Table 29. *Ex Ante* and *Ex Post* Comparison for School and Multifamily Kit LEDs

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
37.7 kWh/yr	37.9 kWh/yr	101%

Water Heater Pipe Wrap

Cadmus estimated per-unit savings from pipe wrap using the following algorithm:

$$Energy\ Savings\ (kWh/Year) = \frac{\left(\left(\frac{1}{R_{EXIST}} - \frac{1}{R_{NEW}}\right) \times L \times C \times \Delta T \times 8{,}760\right)}{RE \times 3413}$$

Where:

R_{EXIST} = Pipe heat loss coefficient of uninsulated pipe (existing; Btu/hr-°F-ft; = 1.0)

R_{NEW} = Pipe heat loss coefficient of insulated pipe (new; Btu/hr-°F-ft)

L = Length of pipe from a water heating source covered by pipe wrap (in feet)

C = Circumference of pipe (in feet; = diameter (in) * π * 0.083)

ΔT = Average temperature difference between supplied hot water and ambient air temperatures (°F)

8,760	=	The number of hours per year during which heat loss occurs (hr/yr)
RE	=	Recovery efficiency of the electric hot water heater
3,413	=	The conversion rate from Btu to kWh (Btu/kWh)

Table 30 shows the inputs for the engineering algorithm used to determine savings for one foot of pipe wrap, delivered through both the school kits and multifamily kits delivery channels.

Table 30. Pipe Wrap Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
R_{EXIST}	1	Secondary Source[a]	1	Secondary Source[a]
R_{NEW}	4	PY14 Program Data	4	PY14 Program Data
L	1	PY16 assumption	1	PY16 assumption
C	0.196	Calculated (assumed 3/4-inch diameter)[b]	0.196	Calculated (assumed 3/4-inch diameter)[b]
ΔT	67.5	Secondary Source; Ameren Missouri 2012 TRM[c]	58.9	Secondary Source; PY11MFIQ site-visits[d]
8,760	8,760	Constant (Hours per year)	8,760	Constant (Hours per year)
RE	0.98	Secondary Source[e]	0.98	Secondary Source[e]
3,413	3,413	Conversion Factor (Btu/kWh)	3,413	Conversion Factor (Btu/kWh)

[a] Navigant Consulting Inc. "Measures and Assumptions for Demand Side Management Planning; Appendix C Substantiation Sheets." pp. 77. April 2009.

[b] This 3/4-inch is standard pipe diameter.

[c] Ambient air temperature is 67.5°F and DHW setpoint is 135°F based on: U.S. Department of Energy. Test Procedure for Water Heaters. May 11, 1998. Available online: http://www.gpo.gov/fdsys/pkg/FR-1998-05-11/pdf/98-12296.pdf. The hot water temperature was 135°F according to Ameren Missouri 2012 TRM.

[d] Ambient air temperature is 67.5°F based on DOE 1998. Hot water temperature of 126.4°F based on site visits.

[e] NREL 2009. pp. 12.

Using this engineering algorithm, the team determined an *ex post* energy savings value of 26 kWh/year for one foot of pipe wrap included in a school kit. This value equaled the program's *ex ante* savings estimate, shown in Table 31.

Table 31. *Ex Ante* and *Ex Post* Comparison for School Kit Pipe Wrap

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
26 kWh/yr	26 kWh/yr	100%

The team determined an *ex post* energy savings value of 22.7 kWh/year for each pipe wrap included in a multifamily kit. This value equaled the program's *ex ante* savings estimate, as shown in Table 32.

Table 32. *Ex Ante* and *Ex Post* Comparison for Multifamily Kit Pipe Wrap

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
22.7 kWh/yr	22.7 kWh/yr	100%

Furnace Filter Alarms

The furnace filter alarm is designed to save energy at the heating or cooling equipment motor by alerting homeowners that the filter needs to be changed. Cadmus estimated furnace filter alarm savings using the following algorithm for alarms delivered through both the school kits and multifamily kits delivery channels:

$$\Delta\text{kWh/yr} = \left(\frac{\Delta\text{kWh}}{yr_{heat}} + \frac{\Delta\text{kWh}}{yr_{cool}}\right)$$

$$\frac{\Delta\text{kWh}}{yr_{heat}} = kW_{motor} \text{ x } EFLH_{heat} \text{ x EI}$$

$$\frac{\Delta\text{kWh}}{yr_{cool}} = kW_{motor} \text{ x } EFLH_{cool} \text{ x EI}$$

Where:

kW_{motor}	=	Average motor full load electric demand (kW)
$\text{EFLH}_{\text{heat}}$	=	Estimated full-load heating hours for region (hours/year)
$\text{EFLH}_{\text{cool}}$	=	Estimated full-load cooling hours for region (hours/year)
EI	=	Efficiency improvement (%)

Table 33 shows the input values used in the furnace filter alarm algorithm and their sources.

Table 33.Furnace Filter Alarm Savings Assumptions

Term	Value: School	Source: School	Value: Multifamily	Source: Multifamily
kW_{motor}	0.5	Pennsylvania TRM*	0.5	Pennsylvania TRM*
$\text{EFLH}_{\text{heat}}$	1,496	PY16 HVAC Metering Study	1,496	PY16 HVAC Metering Study
$\text{EFLH}_{\text{cool}}$	869	Ameren Missouri 2012 TRM**	869	Ameren Missouri 2012 TRM**
EI	15%	Pennsylvania TRM*	15%	Pennsylvania TRM*

* Public Utilities Commission. *State of Pennsylvania Technical Reference Manual.* pp 73. 2016. Available online: http://www.puc.pa.gov/pcdocs/1370278.docx

** *Ameren Missouri 2012 Technical Resource Manual.* Appendix A. Available online: https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935658483

Using this engineering algorithm, the team determined an *ex post* energy savings value of 149.2 kWh/year for each furnace filter alarm distributed in the school kits. This value was approximately 76% of the program's *ex ante* value (195.8 kWh/year), as shown in Table 34. The team adjusted the cooling EFLH and heating EFLH based on student family participant survey results. Surveys indicated that 95% of participants only had heating systems and 95% of participants only had cooling systems that

function with the furnace filter alarm. The difference between ex ante and ex post estimates resulted from this update, as well as updates to the ELFH based on PY16 metering results.

Table 34. *Ex Ante* and *Ex Post* Comparison for School Kit Furnace Filter Alarm

Ex Ante Savings/Unit	*Ex Post* Savings/Unit	Realization Rate
195.8 kWh/yr	168.3 kWh/yr	86%

Summary

Table 35 lists per-unit, *ex ante* and *ex post* gross savings by measure (kWh); and Table 36 lists the same for demand reduction (KW).

Table 35. PY16 Summary: Comparison of *Ex Ante and Ex Post* Per-Unit Gross Savings

Measure	Per Unit *Ex Ante* (kWh/yr)	Per Unit Ex *Post* (kWh/yr)	Realization Rate
School Kit			
Energy-Efficient Showerhead	181.6	330.5	182%
Energy-Efficient Kitchen Faucet Aerator	79.7	250.1	314%
Energy-Efficient Bathroom Faucet Aerator	22.1	40.7	184%
LEDs	37.7	37.9	101%
Water Heater Pipe Wrap	26.0	26.0	100%
Furnace Filter Alarm	195.8	168.3	86%
Multifamily Kit			
Energy-Efficient Showerhead	-	-	-
Energy-Efficient Kitchen Faucet Aerator	78.3	115.9	148%
Energy-Efficient Bathroom Faucet Aerator	38.0	33.5	88%
LEDs	37.7	37.9	101%
Water Heater Pipe Wrap	22.7	22.7	100%
Furnace Filter Alarm	-	-	-

Table 36. PY16 Summary: Comparison of *Ex Ante and Ex Post* Per-Unit Demand Reduction

Measure	Per Unit *Ex Ante* (kW/yr)	Per Unit Ex *Post* (kW/yr)	Realization Rate
School Kit			
Energy-Efficient Showerhead	0.016	0.029	182%
Energy-Efficient Kitchen Faucet Aerator	0.007	0.022	314%
Energy-Efficient Bathroom Faucet Aerator	0.002	0.004	184%
LEDs	0.006	0.006	101%
Water Heater Pipe Wrap	-	-	-
Furnace Filter Alarm	0.091	0.078	86%
Multifamily Kit			
Energy-Efficient Showerhead	-	-	-
Energy-Efficient Kitchen Faucet Aerator	0.007	0.010	148%
Energy-Efficient Bathroom Faucet Aerator	0.003	0.003	88%
LEDs	0.006	0.006	101%
Water Heater Pipe Wrap	-	-	-
Furnace Filter Alarm	-	-	-

To estimate the program's total gross energy savings, the team applied the per-unit values shown in Table 35 to the Energy Efficiency Kits PY16's participation rates, and adjusted for percentages installed and operating, electric water heating saturation, and whether or not the school kit was installed by an Ameren Missouri Customer (shown in Table 37).

Table 37. PY16 Summary: *Ex Post* Program Gross Savings Accounting for Installation Rates

Measure	n	Per-Unit *Ex Post* Savings (kWh/hr)	Percentage Installed and Operating	Electric Water Heating Saturation	Ameren Missouri Customers	Total *Ex Post* Savings (kWh/yr)	Total *Ex Post* Savings (kW/yr)
School Kit							
Energy-Efficient Showerhead	16,245	330.53	65%	40%	86%	1,195,350	106
Energy-Efficient Kitchen Faucet Aerator	16,245	250.12	53%	40%	86%	745,757	66
Energy-Efficient Bathroom Faucet Aerator	16,245	40.72	57%	40%	86%	129,322	11
LEDs	64,980	37.91	92%	100%	86%	1,938,709	289
Water Heater Pipe Wrap	48,735	25.99	74%	40%	86%	321,137	N/A
Furnace Filter Alarm	16,245	168.29	47%	100%	86%	1,112,465	518
Multifamily Kit							
Energy-Efficient Showerhead	-	-	-	-	-	-	-
Energy-Efficient Kitchen Faucet Aerator	82	115.87	100%	100%	100%	9,501	0.8
Energy-Efficient Bathroom Faucet Aerator	82	33.46	100%	100%	100%	2,744	0.2
LEDs	328	37.91	98%	100%	100%	12,186	1.8
Water Heater Pipe Wrap	492	22.68	100%	100%	100%	11,157	N/A
Furnace Filter Alarm	-	-	-			-	-
Total	**179,679**	**N/A**	**N/A**	**N/A**	**N/A**	**5,478,328**	**994**

Net Impact Evaluation Results

Cadmus determined total program net impacts by calculating total gross savings by measure group and then applying the following[9]:

- Participant Free Ridership
- Participant Spillover
- Nonparticipant Spillover (NPSO)

Cadmus determined participant free ridership and participant spillover ratios for school kit participants using surveys completed during PY16.

Free ridership equals the percentage of savings that would have occurred in a program's absence due to participants purchasing the same measures without the program's influence. Thus, free riders can be considered customers who would have purchased a measure independently of a program. As they account for some program costs but none of its benefits, they decrease a program's net savings.

Spillover equals savings that occur when customers undertake installation of energy efficiency measures or perform energy-efficient activities without receiving financial assistance. For participating customers, this is due to their experience participating in a given program, whereas non participating customers engage in energy-efficient activities due to awareness resulting from program marketing. Unlike free ridership, spillover savings do not generate program costs; rather, energy-saving benefits occur, which increase net savings.

To calculate the Energy Efficiency Kits program's NTG, the Cadmus team used the following formula:

$$NTG = 1 - Freeridership + Participant\ Spillover$$

Cadmus applied the resulting NTG ratio to the *ex post* gross savings for each program measure to calculate net savings for the program measures, then added the Energy Efficiency Kits generated NPSO savings to arrive at total net program savings. Because NPSO is of significant size and does not have the same load shape as the program, we did not include NPSO in the NTG ratio associated with the program, but rather added the net energy and demand impacts separately.

Table 38 presents PY16 program net impacts.

[9] Cadmus relied upon the Uniform Methods Project definition of spillover than includes both poarticipant and nonparticipant spillover that include subsets of both like and non-like spillover. This is located on page 3 of the linked document. https://energy.gov/sites/prod/files/2015/02/f19/UMPChapter23-estimating-net-savings_0.pdf

Table 38. PY16 Net Impact Results Summary

Program Measure	*Ex Post* Gross Savings (MWh/yr)	Free Ridership	Participant Spillover	NTG (w/o NPSO)	Net Savings (MWh/yr)	Net Savings (kW/yr)
School Kits						
Energy-Efficient Showerhead	1,195	21.1%	4.8%	83.7%	1,001	89
Energy-Efficient Kitchen Faucet Aerator	746	15.4%	4.8%	89.4%	667	59
Energy-Efficient Bathroom Faucet Aerator	129	12.0%	4.8%	92.8%	120	11
LEDs	1,939	49.8%	4.8%	55.0%	1,066	159
Water Heater Pipe Wrap	321	18.6%	4.8%	86.2%	277	-
Furnace Filter Alarm	1,112	10.5%	4.8%	94.3%	1,049	489
Subtotal	**5,443**	**28.0%**	**4.8%**	**76.8%**	**4,179**	807
Multifamily Kits*						
Energy-Efficient Showerhead	-	-	-	-	-	-
Energy-Efficient Kitchen Faucet Aerator	10	3.7%	3.4%	99.7%	9	0.8
Energy-Efficient Bathroom Faucet Aerator	3	3.7%	3.4%	99.7%	3	0.2
LEDs	12	24.1%	3.4%	79.3%	10	1.4
Water Heater Pipe Wrap	11	10.7%	3.4%	92.7%	10	-
Furnace Filter Alarm	-	-	-	-	-	-
Subtotal	36	**12.9%**	**3.4%**	**90.5%**	**32**	2.5
NPSO					**5**	**2**
Program Total	**5,478**	**27.9%**	**4.8%**	**77%**	**4,217**	**811**

*The team applied kit-specific, free ridership estimates from the PY14 Efficient Products program to the Multifamily Kit portion of the PY16 Energy Efficient Kits Program. The design of the PY14 Efficient Products program's energy efficient kits program track more closely resembled the PY16 Energy Efficient Kits Multifamily delivery channel than the School Kits delivery channel of the PY16 Energy Efficient kits program.

School Kit Free Ridership Results

Cadmus used a participant self-report approach to determine free ridership ratios for 395 participants who chose to install at least one of the items provided in the kit. This approach relied on questions focusing on the following key areas:

- Would the survey respondent have installed the measures without the program?

- In the program's absence, when would the survey respondent have installed the measures?

Free Ridership Scoring

Through analysis of answers to these core questions, the team assigned school kit recipients' measure-level free ridership scores of 0% to 100%, then calculated an average free ridership score for each measure offered as part of the Energy Efficiency Kits Program. The following process determined a participant's free ridership score[10]:

- The team categorized customers as 0% free riders if:
  - They had no plans to install the measure in the program's absence
  - They would not have installed the measure within one year in the program's absence
- The team categorized a customer's measure at 100% free ridership if they would have installed the same measure at the same time in the program's absence
- The team assigned a 50% free ridership score to a customer's measure if they would have purchased and installed the measure later, but within the same year they received the kit
- The team assigned a 12.5% free ridership score to a customer's measure if they would have purchased and installed the measure, but did not know exactly when they would have done so

Free Ridership Results

After translating survey responses into each participant's free ridership score, the team calculated an average free ridership estimate, weighted by evaluated savings, for each kit measure. Table 39 provides PY16 free ridership estimates by measure.

[10] According to The Energy Efficiency Program Impact Evaluation Guide, from the State and Local Energy Efficiency Action Network, dated December 2012, "A participant is a total free rider if he or she would have absolutely installed the exact same project at the exact same time, at the same price, even if the program did not exist—and they know that." https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

Table 39. Energy Efficiency Kits Free Ridership Results

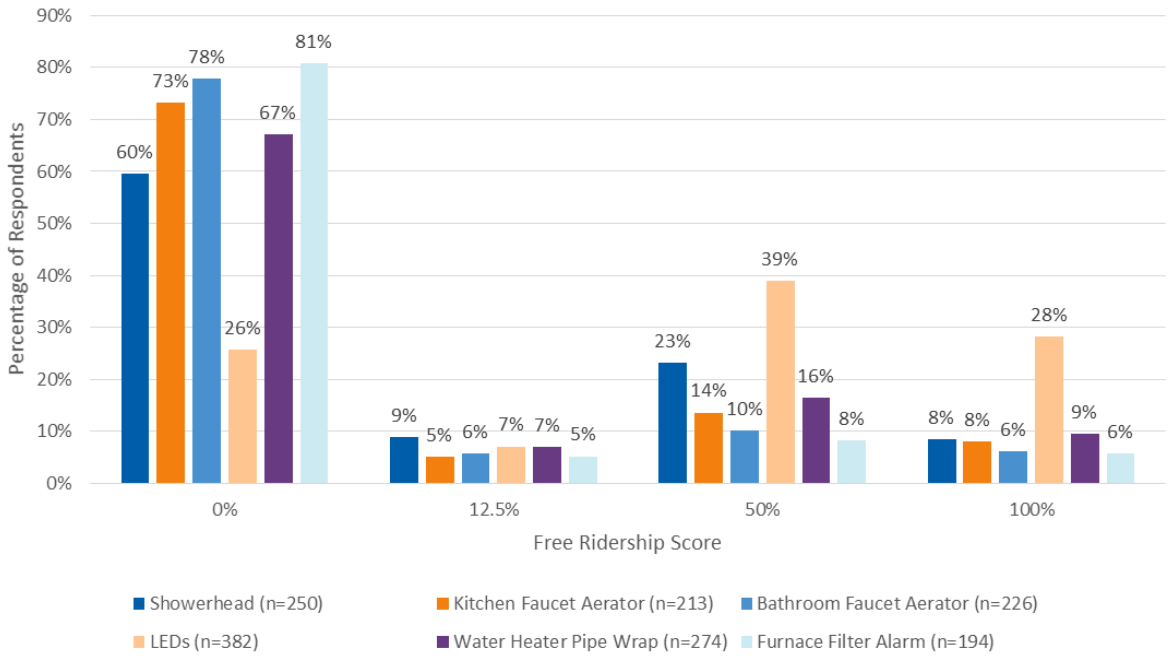
Program Measure	n	Total Weighted Free Ridership Estimate
School Kits		
Energy-Efficient Showerhead	250	21.1%
Energy-Efficient Kitchen Faucet Aerator	213	15.4%
Energy-Efficient Bathroom Faucet Aerator	226	12.0%
LEDs	382	49.8%
Water Heater Pipe Wrap	274	18.6%
Furnace Filter Alarm	194	10.5%
Multifamily Kits*		
Energy-Efficient Kitchen Faucet Aerator	30	3.7%
Energy-Efficient Bathroom Faucet Aerator		
LEDs	17	24.1%
Water Heater Pipe Wrap	28	10.7%

*The team applied kit-specific, free ridership estimates from the PY14 Efficient Products program to the Multifamily Kit portion of the PY16 Energy Efficient Kits Program. The design of the PY14 Efficient Products program's energy efficient kits program track more closely resembled the PY16 Energy Efficient Kits Multifamily delivery channel than the School Kits delivery channel of the PY16 Energy Efficient kits program.

Distribution of School Kit Free Ridership Scores

Figure 8 shows the distribution of assigned free ridership scores by program measure. Of all kit measures, the furnace filter alarm had the highest percentage (81%) of respondents estimated as 0% free riders. The furnace filter alarm measure also had the lowest percentage (6%) of respondents estimated as 100% free riders. LEDs had the lowest percentage (26%) of respondents estimated as 0% free riders and the highest percentage (28%) of respondents estimated as 100% free riders.

Figure 8. Overall Distribution of School Kit Free Ridership Scores by Measure



Participant Spillover Results

Cadmus asked school kit delivery channel participants whether they took additional energy-efficient actions since participating in the program. To calculate spillover, the team asked them to rate the importance of the following factors on their decisions to purchase additional energy efficient equipment:

1. Receiving kit measures through Ameren Missouri's Energy Efficiency Kits program
2. Information they heard from Ameren Missouri or about the benefits of installing the additional energy-efficient equipment

Survey respondents reported installing 35 additional energy-efficient measures after participating in the Energy Efficiency Kits program, and said their program experience was "very important" to the subsequent decision to purchase a high-efficiency appliance rather than a standard-efficiency model.

The team estimated energy savings for the participants' spillover responses, and then divided the total Energy Efficiency Kits program survey sample spillover savings by the survey sample gross program savings, drawn from the survey sample and described in the following equation:

$$Spillover\ \% = \frac{\sum[Spillover\ kWh\ savings\ for\ all\ survey\ respondents]}{\sum[Program\ kWh\ savings\ for\ all\ survey\ respondents]}$$

Table 40 presents a summary of the spillover details.

Table 40. Participant Spillover

Spillover Measure	Quantity	Participant Spillover kWh/year Savings*	Total Survey Sample Program kWh/year Savings
Efficient Central Air Conditioner	2	323.5*	646.9
Efficient Clothes Washer—Electric Water Heat	4	60.0**	240.0
Efficient Clothes Washer—Gas Water Heat	1	17.2***	17.2
Efficient Freezer	2	30.5†	61.0
Efficient Furnace Fan	1	458.4*	458.4
Efficient Refrigerator	4	18.5††	73.8
Efficient Room Air Conditioner	1	44.6†††	44.6
Efficient Electric Water Heater	1	157.0^	157.0
Efficient Windows	2	186.9^^	373.8
Efficient Insulation	6	192.3^^	1,153.8
Dual-Fuel Heat Pump	1	755*	755.0
Heat Pump Water Heater	1	2,531.5†††	2,531.5
Recycled A Refrigerator	5	247.2^^^	1,235.8
Smart Thermostat	4	462.0†††	1,848.0
Program Total			**9,596.6**

* Based on savings calculated for the PY16 Heating and Cooling program.

**Deemed savings for gas water heating and unknown dryer fuel, from the Illinois TRM Version 5.0 Volume 3. Reduced by one half due to high market shares of ENERGY STAR clothes washers.

***Deemed savings for electric water heating and unknown dryer fuel, from the Illinois TRM Version 5.0 Volume3. Reduced by one half due to high market shares of ENERGY STAR clothes washers.

†Deemed savings for ENERGY STAR Freezer from Ameren Missouri 2012 Energy Efficiency Filing Appendix A TRM. Reduced by one half due to high market shares of ENERGY STAR freezers.

††Deemed savings for ENERGY STAR Refrigerator from the Illinois TRM Version 5.0 Volume 3. Reduced by one half due to high market shares of ENERGY STAR refrigerators.

†††Based on savings calculated for the PY16 Efficient Products program.

^Deemed savings from Ameren Missouri 2012 Energy Efficiency Filing Appendix A TRM.

^^Based on savings calculated for the PY15 Home Energy Analysis program.

^^^Based on ½ savings calculated for PY15 Refrigerator Recycling program to account for uncertainty on whether the refrigerator was resold.

The results yielded a 4.8% spillover estimate for the PY16 school kits delivery channel, as show in Table 41.

Table 41. Participant Spillover Percentage

Survey Sample Spillover kWh Savings	Survey Sample Gross Program kWh Savings	Spillover %
9,596.6	199,360	4.8%

Nonparticipant Spillover

Effective program marketing and outreach generates program participation *and* increases general energy efficiency awareness among customers. The cumulative effect of sustained utility program and

general marketing can affect customers' perceptions of their energy usage, and, in some cases, motivates customers to take efficiency actions outside of the utility's program. The energy savings caused by, but not rebated through, a utility's demand-side management activity are spillover savings. The spillover savings accrued by customers who did not participate in Ameren Missouri's programs are nonparticipant spillover, or NPSO.

During PY16, Ameren Missouri spent over $1.1 million dollars to market individual residential efficiency programs (excluding Low Income and Home Energy Report).[11] To understand whether Ameren Missouri's program-specific marketing efforts generated energy efficiency improvements outside of Ameren Missouri's incentive programs, Cadmus implemented a phone survey of residential customers who did not participate in Ameren Missouri's incentive programs in PY16. As this survey has been implemented annually since PY13, the PY16 version represents the latest effort in monitoring nonparticipant activity.

Methodology

Survey Sampling and Disposition

From Ameren Missouri's entire residential customer base, Cadmus selected customers who did not participate in any Ameren Missouri programs in PY16; these 674,577 customers served as the sample frame for the nonparticipant survey.[12] From this sample frame, the team randomly selected 20,000 customers for the survey sample. The team called customers from this sample until reaching a quota of 200 completed nonparticipant surveys.[13]

The team cross-checked each respondent's account ID and phone numbers against the final participant program tracking databases to ensure that respondents were not confused by the questions and, in fact, participated in the program. Analysis found that two survey respondents participated in the Multifamily Efficient Kits program, but they did not report spillover measures. The NPSO analysis focused on 198 verified nonparticipants to avoid potential double-counting of program-specific spillover.

Like and Non-Like Spillover Measures

The survey asked respondents whether they installed any of 11 energy efficiency measures offered by Ameren Missouri programs (i.e., "like" spillover), with the notable exception of products in the Lighting and HVAC programs. The like NPSO analysis excluded products in the Lighting and HVAC programs to

[11] The Home Energy Report program is evaluated using billing analysis, which accounts for both program savings and spillover savings. Thus, it is excluded from this NPSO analysis.

[12] Cadmus removed invalid or duplicate phone numbers from the sample frame, as well as Home Energy Report participants.

[13] A small number of survey respondents (n=17) self-reported that they participated in an Ameren Missouri residential program in PY16, so they are not part of the 200 nonparticipant completes.

avoid double-counting NPSO savings already captured through those programs' like NPSO analyses, as described in those reports.

In addition, the survey asked respondents whether they installed energy efficiency measures or performed energy-saving actions outside of Ameren Missouri's PY16 program offerings (i.e., "non-like" spillover). The rationale for including non-like spillover was that Ameren's program marketing and outreach would raise general awareness of energy efficiency and could result in Ameren Missouri customers taking additional steps to save energy on their own.

For example, some respondents reported installing non-like measures previously offered through Ameren Missouri programs and might have been influenced by Ameren Missouri's prior program marketing and outreach. In addition, Ameren Missouri customers might have adopted other non-like measures due to Ameren Missouri's program marketing and outreach changing their general attitudes towards energy efficiency.

NPSO Selection Criteria

To confirm a relationship between Ameren's energy efficiency programs and measures adopted by nonparticipants, Cadmus created a set of selection criteria and operationalized these into survey questions. To be included in the NPSO analysis, nonparticipating respondents had to meet all of the following criteria:

a) Familiarity with at least one Ameren Missouri program, rebate, or discount[14]

b) At least one element of Ameren's program marketing and outreach motivated them to adopt the measure

c) They had a valid reason for considering the adopted measure energy efficient

d) For a like measure, they had not received a rebate from Ameren, and had not already tried to receive a rebate from Ameren, and they stated a valid reason for not applying for an Ameren Missouri measure rebate

e) They had a valid reason for deciding to install the measure

f) The adopted measure generated electric savings, not gas savings

For criterion b), the team asked respondents to rate several Ameren Missouri program marketing and outreach elements (as shown in Table 42) importance in motivating them to adopt the spillover measure "very important," "important," "not important," or "not important at all". For like measures, the measure in question met criterion b) if the respondent found at least one element "very important" or "important" in deciding to adopt the measure. For non-like measures, respondents had to find at least one element "very important".

[14] Responding "Yes" to C2 "Have you ever seen or heard of the Ameren Missouri energy efficiency programs?" or C10 "Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?"

Table 42. Ameren Missouri Marketing and Outreach Elements for Criterion B

Statement
Information about energy savings from Ameren's marketing or bill-inserts
Information from colleagues or friends who installed energy-efficient equipment and received a rebate from Ameren Missouri
If applicable, past participation in an Ameren Missouri rebate program
If applicable, information from the energy assessment conducted at your home through Ameren

Criterion c) helped ensure that spillover measures actually generated energy savings. For applicable measures, the team asked respondents how they knew that their product was energy efficient. Responses passing criterion c) included "it's ENERGY STAR rated" or "the retailer/dealer/contractor told me it was."

If respondents reported adopting a like measure, the team asked whether they received a rebate from Ameren Missouri (to double-check whether respondents truly did not participate in the program). The team then asked why they or their contractor did not apply for a rebate through Ameren Missouri. If respondents reported that they applied for a rebate but did not receive it (as their product did not qualify), their adopted measure did not pass criterion d). Hence, the team excluded the measure in NPSO.

The team also asked respondents why they decided to adopt the measure. If the response directly contradicted criterion b), c), or d), the measure did not pass criterion e). For example, one respondent reported installing an "Efficient room air conditioner" because "it was free and I didn't have any choice." This response contradicted criterion b)—that Ameren Missouri's marketing and outreach influenced the measure adoption.

As the PY16 evaluation only concerned electric savings generated by Ameren's programs, the team asked respondents for the fuel types for their water heaters, heating systems, and cooling systems. Reported like and non-like measures satisfied criterion f) if the measures had a corresponding electric water heater, electric heat, or electric cooling.

Results

Of 198 verified nonparticipant respondents, 27 respondents adopted measures that were not incentivized and passed all six NPSO criteria (see Appendix E. School Administrator Interview Guide, Student Family Survey, Nonparticipant Spillover Survey Data). None of these 27 respondents received an incentive from Ameren Missouri for any measure. They were only influenced by Ameren Missouri program marketing and outreach, and adopted NPSO measures on their own.

From these 27 respondents, six respondents reported adopting a total of seven non-incentivized like measures, and 23 respondents adopted a total of 32 non-incentivized non-like measures.

Like NPSO

Table 43 shows like measures and gross evaluated kWh savings attributed to Ameren, achieving average savings of 176 kWh (Variable A).

Table 43. Like NPSO Response Summary

Individual Reported Like Measures	Importance of Ameren Missouri Influence on Adoption	Measure Savings (kWh)*	Allocated Savings	Total kWh Savings	Avg kWh Per Spillover Measure
Efficient kitchen faucet aerators	Somewhat	250*	50%	125	A
Efficient kitchen faucet aerators	Very	250*	100%	250	
Efficient kitchen faucet aerators	Very	250*	100%	250	
Efficient room air conditioner	Somewhat	45**	50%	22	
Efficient room air conditioner	Somewhat	45**	50%	22	
Efficient showerheads	Very	331*	100%	331	
Learning or "smart" thermostat	Somewhat	462**	50%	231	
Total (n=7)				**1,231**	**176**

*Based on savings calculated for the PY16 EE Kits program.

**Based on savings calculated for the PY16 Efficient Products program.

To determine total like NPSO generated by Ameren Missouri's marketing in PY16, Cadmus extrapolated like NPSO savings per like measure (Table 43) to Ameren Missouri's entire PY16 residential nonparticipant population. Table 44 presents the like NPSO analysis, resulting in like NPSO total evaluated savings of 5,050 MWh portfolio level.

Table 44. Like NPSO Analysis

Variable	Metric	Value	Source
A	Average kWh Savings per Like Measure	176	Survey Data; PY16 Impact Evaluation
B	Number of Like Measures	7	Survey Data
C	Number of Nonparticipant Respondents	198	Survey Disposition
D	Total Residential Population Minus PY16 Participants	812,009	Customer Database
E	Total Like NPSO MWh Savings Applied to Population	5,050	(((B ÷ C) × A) × D)/1000

Like NPSO savings in PY16 (5,050 MWh) are smaller than savings reported in PY15 (12,247 MWh). This is due to three factors: a) the total *ex post* residential portfolio savings in PY16 (95,249 MWh) decreased from PY15's 142,016 MWh, b) the like NPSO savings as a percent of total portfolio savings in PY16 (5.3%) also decreased from 8.6% in PY15, and c) several measures are no longer "like" measures as in PY15, such as insulation, refrigerator/freezer recycling, programmable thermostats, and windows. Whereas PY15's survey reported like measures from a variety of Ameren Missouri programs, PY16's reported like measures are mostly efficient kitchen faucet aerators from the EE Kits program and efficient room air conditioners in the Efficient Products program.

Non-like NPSO

Cadmus followed a similar methodology as for like spillover in computing non-like spillover with two exceptions. Table 45 shows non-like measures and gross evaluated kWh savings attributed to Ameren, achieving average savings of 110 kWh (Variable A in Table 45). The first exception, in contrast with the like NPSO, we only counted non-like NPSO when the respondent rated Ameren Missouri's influence on the measure adoption as "very important". Due to uncertainty around how Ameren Missouri's marketing influences non-like measure adoption, we were more conservative in counting savings. For the second exception, we estimated savings from individual measures more conservatively:

- Because ENERGY STAR market shares are generally high for efficient clothes washers, freezers, and refrigerators, the team allocated only 50% of the measure savings. Although respondents rated the program as "very important" in their decision to purchase, it is likely that at least some respondents would have bought an ENERGYSTAR product regardless of Ameren's influence.
- For the measure defined as "removing a refrigerator or freezer", it is possible that respondents sold it or gave it to someone else rather than recycling, in which case the savings generated from the removing would be over-estimated. Again, even though the respondent rated Ameren Missouri's marketing as very important, and had mentioned it as an energy saving activity, we allocated 50% of the savings to spillover.
- We excluded efficient dishwashers from the spillover analysis because virtually all dishwashers on the market are already ENERGYSTAR-certified.

Table 45. Non-like NPSO Response Summary

Individual Reported Non-like Measures	Quantity	Measure Savings (kWh)	Allocated Savings	Total kWh Savings	Avg kWh Per Spillover Measure
Insulation	3	192[a]	100%	577	A
Efficient clothes washer (gas water heating)	2	34[b]	50%	34	
Efficient clothes washer (electric water heating)	1	120[c]	50%	60	
Efficient freezer	4	61d	50%	122	
Efficient refrigerator	2	37e	50%	37	
Efficient water heater (other than heat pump water heater)	2	157f	100%	314	
Efficient Windows	2	187[g]	100%	374	
Programmable (but not "smart") thermostat	1	83[h]	100%	83	
Programmed thermostat to reduce usage	8	83[h]	100%	664	
Removed a refrigerator or freezer	3	494[i]	50%	741	
Scheduled an air conditioner tune-up	4	126[h]	100%	504	
Total (n=32)				**3,510**	**110**

[a]Average ceiling insulation savings per home, calculated for the PY15 Home Energy Analysis.

[b]Deemed savings for gas water heating and unknown dryer fuel, from the Illinois TRM Version 5.0 Volume 3.

[c]Deemed savings for electric water heating and unknown dryer fuel, from the Illinois TRM Version 5.0 Volume 3.

[d]Deemed savings for ENERGY STAR Freezer from Ameren Missouri 2012 Energy Efficiency Filing Appendix A TRM.

[e]Deemed savings for ENERGY STAR Refrigerator from the Illinois TRM Version 5.0 Volume 3.

[f]Deemed savings from Ameren Missouri 2012 Energy Efficiency Filing Appendix A TRM.

[g]Based on savings calculated for the PY15 Home Energy Analysis.

[h]Based on savings calculated for the PY15 Heating and Cooling program.

[i]Based on savings calculated for the Appliance Recycling program (refrigerator/freezer recycling savings minus refrigerator/freezer replacement savings).

Using the same extrapolation method as for the like NPSO analysis, Cadmus determined total non-like NPSO generated by Ameren Missouri's PY16 marketing in MWh savings. Table 46 presents the non-like NPSO analysis, resulting in non-like NPSO evaluated savings of 14,396 at the portfolio level.

Table 46. Non-like NPSO Analysis

Variable	Metric	Value	Source
A	Average kWh Savings per Non-like Measure	110	Survey Data; PY15 Impact Evaluation; Ameren Missouri TRM; Illinois TRM
B	Number of Non-like Measures	32	Survey Data
C	Number of Nonparticipant Respondents	198	Survey Disposition
D	Total Residential Population Minus PY16 Participants	812,009	Customer Database
E	Total Non-like NPSO MWh Savings Applied to Population	14,396	(((B ÷ C) × A) × D)/1000

Spillover Allocation to Individual Programs

Combining the above analyses, Cadmus observed 19,446 MWh of combined like and non-like NPSO, consisting of 20.4% of total evaluated savings. The team considered the following three approaches for allocating total observed NPSO to individual programs:

1. **Even Allocation**: The most straightforward approach allocated NPSO evenly across the residential programs (i.e., made a 20.4% adjustment to each program's NTG). This equaled applying NPSO at the portfolio-level, and, therefore, assumed all programs contributed equally to generating NPSO.
2. **"Like" Programs:** Another approach allocated NSPO savings to specific programs, based on the measure that the nonparticipant installed. This approach only applied to like NPSO. For example, one nonparticipant reported installing a smart thermostat, motivated by Ameren's marketing. Using this approach, the team assigned NPSO savings associated with the installation to the Efficient Products Program.

   While this approach established a clear connection between a reported spillover measure and Ameren's program (which promoted that measure), the research found this direct measure-program relationship did not prove as straightforward as it appeared.

   Specifically, while all seven respondents reporting like NPSO knew of Ameren Missouri programs, only one respondent was familiar with the specific program corresponding to the measure they installed.[15] This indicated that Ameren Missouri generated NPSO through the cumulative effects of various program-specific marketing efforts, and mapping spillover measures solely to the program offering the specific measure could undervalue the overall impact of cumulative and sustained energy efficiency messaging.
3. **Marketing Budget and Program Size.** The final allocation approach that the team considered—and eventually chose to use—assigned overall NSPO as a function of each program's marketing and program budget (shown in Table 47). This approach remained consistent with the theory that NPSO resulted from the cumulative effects of program-specific marketing and program

[15] C11 "What rebates or discounts have you heard about?"

activity over a period—not necessarily by a single, program-specific marketing effort. In addition, while NPSO most commonly was associated with mass media marketing campaigns, the scale of program activity also counted as a factor.

For example, even without a significant marketing campaign, a program's size can drive NPSO through word-of-mouth and in-store program messaging. The team found this approach accurately reflected and attributed NSPO to programs, ensuring those total costs (including marketing) and total benefits (net savings including NPSO) were properly accounted for when assessing overall program cost-effectiveness.

Table 47. Combined Savings and Marketing Allocation

Program	Program *Ex Post* Gross Savings (MWh)	Percentage of Portfolio Savings	Program Marketing	Percentage of Total Marketing	Combined Savings & Marketing (AxB)	Percentage of Combined Savings & Marketing
Lighting	38,349	40.4%	$45,000	5.6%	2.3%	5.9%
Efficient Products	2,940	3.1%	$97,882	12.2%	0.4%	1.0%
HVAC	44,661	46.9%	$608,571	75.6%	35.4%	92.4%
Smart Thermostats	3,732	3.9%	$52,530	6.5%	0.3%	0.7%
EE Kits	**5,478**	**5.8%**	**$1,479**	**0.2%**	**0.0%**	**0.0%**
Total	**95,249**	**100%**	**$805,462**	**100%**	**38.3%**	**100%**

Using the Market Budget and Program Size allocation method, the team distributed the portfolio-level result of 19,446 MWh NPSO to each of Ameren Missouri's residential programs. As shown in Table 48, the results of this approach reflected each program's impact on the nonparticipant population, proxied by the combined effect of marketing expenditures and program savings. The EE Kits program achieved 0.03% of the total NPSO, at 5 MWh.

Table 48. NPSO by Program

Program	Program Gross Savings (MWh)	Total NPSO (MWH)	Percent of Combined Savings/ Marketing	Program-Specific NPSO (MWh)
Lighting	38,349	19,446	5.9%	1,144
Efficient Products	2,940		1.0%	190
HVAC	44,661		92.4%	17,977
Smart Thermostats	3,732		0.7%	130
EE Kits	**5,478**		**0.0%**	**5**
Total	**95,249**		**100%**	**19,446**

Benchmarking

For program years 2016–2018 (PY16–PY18), Ameren Missouri introduced and offers the Energy Efficiency Kits Program, a new program. Cadmus researched other utilities that offered measures similar to Ameren's Energy Efficiency Kits program's multifamily and school-based delivery channels.

Benchmarking Metrics and Topics: School-Based Delivery Channel

For the school-based delivery channel benchmarking research compared the following:

- Kit contents
- Measure installation rates
- Program participation
- Ex post per-kit savings (kWh)
- Ex post per-kit savings (kW)
- Net-to-Gross Ratios

For the multifamily delivery channel benchmarking research compared the following:

- Kit contents
- Program participation

The team did not benchmark measure installation rates, ex post per-kit savings, or net-to-gross ratios for the multifamily delivery channel because the multifamily programs offered by other utilities were frequently direct install programs that were tied to an energy audit, and were consequently not comparable.

School Kit Contents and Installation Rates

Cadmus compared similar school kit programs to the school-based delivery channel of Ameren Missouri's Energy Efficiency Kits Program to establish whether grade levels targeted and measures implemented for Ameren Missouri were standard practice, or if other measures could be considered. The comparison programs all offered free energy-efficient products to students and their families, though the targeted grade levels varied. Benchmarked school kit programs most commonly targeted the fifth-grade level. All benchmarked kit programs offered kits to fifth graders, while PNM and IMP targeted fifth grade only, and Vectren Indiana targeted fourth and fifth grade levels. On the other hand, Dayton Power and Light (DP&L) and PPL Electric targeted a more comprehensive range of students, with DP&L distributing kits to grades 5 to 12 and PPL Electric offering kits to grades 2 to 12.

As shown in Table 49, all programs offered showerheads, aerators, and LED or CFL light bulbs to students and their families. Compared to other school kit programs, Ameren Missouri's channel contained all of the most common measures (e.g., light bulbs, showerheads, aerators, a filter alarm) other than an LED night light, which five other benchmarked programs offered. Only one program offered an energy-efficient power strip (PPL Electric) and only to secondary school students.

Table 49. Common School Kit Products

Utility	LED Light Bulbs	CFL Light Bulbs	Night Light	Showerhead	Aerators*	Power Strip	Furnace Filter Alarm
Ameren Missouri	✓			✓	✓		✓
Public Service Co. of New Mexico		✓	✓	✓	✓		
Indiana Michigan Power	✓	✓	✓	✓	✓		✓
PPL	✓		✓	✓	✓	✓	✓
Vectren Indiana		✓	✓	✓	✓		Discontinued
Dayton Power & Light		✓	✓	✓	✓		✓

*All school kit programs offered kitchen and bath aerators except for IMP, which only offered kitchen aerators.

Table 50 compares Ameren Missouri's school kit installation rates with results from similar programs. Lighting measures tended to have the highest installation rates, a result typical of school kit programs. The table presents some installation rates as a range, depending on the bulb wattage for LED and CFL light bulbs or the age group targeted. When comparing other utility programs, Ameren Missouri school kits had the highest installation rates for bathroom aerators, and some of the higher installation rates for the other kit measures.

Table 50. Common School Kit Product Installation Rates

Utility	LED Light Bulbs	CFL Light Bulbs	Night Light	Showerhead	Kitchen Aerator	Bathroom Aerator	Power Strip	Furnace Filter Alarm
Ameren Missouri	**89%**	**Not offered**	**Not offered**	**65%**	**53%**	**57%**	**Not offered**	**47%**
Public Service Co. of New Mexico[a]	Not offered	65%	Not offered	N/A	47%	44%	Not offered	Not offered
	Not offered	72%	Not offered	N/A	54%	51%	Not offered	Not offered
Indiana Michigan Power (IMP) [b]	64%	80-87%	94%	74%	59%	Not offered	Not offered	60%
PPL Electric[c]	89-90%	Not offered	73-86%	25-31%	32%	27%	74%	13%
Vectren Indiana[b]	Not offered	63-70%	86%	52%	47%	47%	Not offered	Not offered
Dayton Power & Light	Not offered	86%	39%	63%	43%	42%	Not offered	N/A

[a]Public Service Company of New Mexico measured installation rates for spring and fall customers. Spring installation rates are shown in the top row, and fall installation rates are shown below.

[b]For IMP and Vectren Indiana, the CFL light bulb installation rate is presented as a range as they offer 23 and 13 watt bulbs, and measured installation rates for those separately.

[c]For PPL Electric, LEDs, CFLs, night lights, and showerheads were offered to different age groups, and installation rates measured for those age groups separately.

School Kit Program Participation and Per-Kit Savings

For the school-based delivery channel, Cadmus compared Ameren Missouri to five other utility programs. Table 51 compares program participation and per-kit savings to Ameren Missouri's school kits, with the results reported for other, similar programs. Of five benchmarked school kit programs, Ameren Missouri's school-based delivery channel sent out one of the greatest number of school kits, and its savings per kit were within the range of the other programs.

Table 51. School-Based Delivery Channel Benchmarking Results: Participation and Per-Kit Savings

Utility	Program	Total Kits Distributed	*Ex Post* Gross Savings (kWh/yr)	*Ex Post* Per Kit Savings (KWh/kit)	*Ex Post Gross Savings* (kW/yr)	*Ex Post* Per Kit Savings (kW/kit)
Ameren Missouri	**PY16 Energy Efficiency Kits Program (School Kits)**	**16,245**	**5,286,170**	**325**	**956.7**	**0.06**
Dayton Power and Light	2015 Residential Energy Education (Be E3 Smart) Program	9,298	4,162,367	448	281	0.03
Indiana Michigan Power	2015 School Energy Education Program	11,744	4,571,388	389	811	0.07
PPL Electric	2015-2016 Student & Parent Energy-Efficiency Education Program	25,085	4,053,000	162	428	0.02
Public Service Co. of New Mexico	2014 Student Efficiency Kits Program	3,578	437,753	122	22.21	0.01
Vectren Indiana	2015 Energy Efficient Schools Program	2,600	920,270	354	58	0.02

School Kit Program Net-to-Gross Ratios

Cadmus compared Ameren Missouri to five other utility programs. As shown in Table 52, of the five utilities benchmarked, four used a NTG ratio of 100%. Indiana Michigan Power's overall NTG ratio is 69%, with measure level NTG ratios of 58% and 87% for CFLs and furnace filter alarms, respectively. Ameren Missouri's school-based delivery channel had an overall savings-weighted, net-to-gross (NTG) ratio (excluding NPSO) of 76.8%.

Table 52. School-Based Delivery Channel Benchmarking Results: Net-To-Gross

Utility	Program	Net-to-Gross
Ameren Missouri	**PY16 Energy Efficiency Kits Program (School Kits)**	**76.8%**
Dayton Power and Light	2015 Residential Energy Education (Be E3 Smart) Program	100%
Indiana Michigan Power	2015 School Energy Education Program	69%
PPL Electric	2015-2016 Student & Parent Energy-Efficiency Education Program	100%
Public Service Co. of New Mexico	2014 Student Efficiency Kits Program	100%
Vectren Indiana	2015 Energy Efficient Schools Program	100%

Multifamily Kit Contents

The Team compared the multifamily kit delivery channel to multifamily direct-install programs to establish whether the kit contents represented standard practice, or if any other measures could be considered. The comparison programs all offered free products to multifamily households; however, all programs other than Ameren's multifamily kits delivery channel worked as direct-install programs (rather than property manager install kit programs). As shown in Table 53, all programs offered CFL light bulbs, showerheads, and kitchen and bathroom aerators to multifamily units. Compared to other multifamily direct-install programs, Ameren Missouri's multifamily kit delivery channel contained most of the common measures provided by utilities, along with measures not typically offered by other programs (e.g., LED light bulbs, pipe wrap). Not shown in Table 53, is one program that offers a thermostat (i.e., Indianapolis Power and Light).

Table 53. Common Multifamily Kit Products

Utility	LED Light Bulbs	CFL Light Bulbs	Showerhead	Kitchen Aerator	Bath Aerator	Pipe Wrap
Ameren Missouri	✓		✓	✓	✓	✓
Entergy Arkansas		✓	✓	✓	✓	
Indianapolis Power and Light		✓	✓	✓	✓	✓
Wisconsin Focus on Energy	✓	✓	✓	✓	✓	✓
Vectren Indiana		✓	✓	✓	✓	

Cadmus compared program participation of Ameren Missouri's multifamily kit delivery channel, with the results reported for four other programs. Due to the unique delivery of Ameren Missouri's multifamily kits, the team could not find programs that directly offer kit programs to property owners and managers to install; consequently, the team benchmarked against direct-install multifamily kits. As shown in Table 54 Ameren Missouri's multifamily kit delivery channel distributed the least number of kits of all benchmarked utilities.

Table 54. Multifamily Kit Delivery Channel Benchmarking Results: Participation

Utility	Program	Total Kits Distributed
Ameren Missouri	**PY16 Energy Efficiency Kits Program (Multifamily Kits)**	**82**
Entergy Arkansas	2015 Multifamily Homes Program	2,092
Indianapolis Power & Light	2015 Residential Multifamily Direct Install Program	7,701
Vectren Indiana	2014 Multifamily Direct Install Program	1,035
Wisconsin Focus on Energy	2015 Multifamily Direct Install Program	5,016

Key Progress Indicators

Cadmus plans to track the following key progress indicators for the Energy Efficiency Kits program:

- Program year electric savings (*Ex Post* Gross Savings)
- Total number of kits distributed
- Recipient's satisfaction with energy efficiency kits and with Ameren Missouri

Table 55 shows the team's key metrics. In the PY17 evaluation, the team will compare these key progress indicators to new results and report any findings.

Table 55. PY16 Energy Efficiency Kits Key Progress Indicators

Key Metric	PY16 School	PY16 Multifamily
Ex Post Gross Savings (kWh/yr)	5,442,740 kWh	35,589 kWh
Total Number of Kits Distributed	16,245	82
Percentage that agree with the statement, "I am satisfied with my child's experience in the Ameren Missouri Energy Efficiency Kits School Program"	99% satisfied (n=400)	N/A
Satisfaction with Ameren Missouri	79% satisfied (n=376)	N/A

Cost-Effectiveness

Ameren Missouri assessed cost-effectiveness using the following five tests, as defined by the California Standard Practice Manual:[16]

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

DSMore takes hourly prices and hourly energy savings from specific measures installed through the Energy Efficiency Kits program, 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.

Key assumptions include the following:

- Discount Rate = 6.46%
- Line Losses = 5.72%
- Summer Peak would occur during the 16th hour of a July weekday, on average
- Avoided Electric T&D = $23.03/kW in 2016 and growing at a rate of 2% annually for the next 24 years
- Escalation rates for different costs occur at the component level, with separate escalation rates for fuel, capacity, generation, T&D, and customer rates carried out over 25 years

Ameren Missouri used evaluation results as model inputs (e.g., PY16-specific Energy Efficiency Kits program participation counts, per-unit gross savings, NTG, NPSO).

Particularly, measure load shapes drove model assumptions, as indicated when the model applied savings during the day. This ensured that the load shape for an end use matched the system peak impacts of that end use, and provided 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,

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

Educational Outreach, Portfolio Administration, Potential Study, and Data Tracking— at the program level, while incentives were applied at the measure level.

Table 56 summarizes cost-effectiveness findings by test. Any benefit-cost score of 1.0 or higher passed the test as cost-effective. As shown, the Energy Efficiency Kits passed the UCT, TRC, and Societal tests.

Table 56. Cost-Effectiveness Results (PY16)

Program	UCT	TRC	RIM	Societal	PART
Energy Efficiency Kits	3.57	5.73	0.52	11.14	N/A*

* Participant cost test is N/A because there are no participant costs for this program.

Appendix A. End-Use Load Shapes and Coincidence Factors

Appendix E

End-Use Category Energy Load Shapes

% Energy by Month

	Residential End-Use Category Load Shape								
Month	**Building Shell**	**Cooling**	**Freezer**	**HVAC**	**Lighting**	**Miscellaneous**	**Pool Spa**	**Refrigeration**	**Water Heating**
January	11.1297%	0.1200%	7.9579%	11.1297%	10.1182%	8.4893%	8.6451%	7.7053%	10.3527%
February	9.3077%	0.1100%	7.2518%	9.3077%	8.8441%	7.7366%	7.1145%	7.2169%	9.0720%
March	7.0042%	0.3130%	8.1080%	7.0042%	9.2879%	8.4863%	8.6052%	8.0272%	9.5543%
April	3.7116%	1.5047%	7.9918%	3.7116%	8.4645%	8.2144%	8.0702%	7.8752%	8.4799%
May	4.0888%	6.5410%	8.4083%	4.0888%	7.9393%	8.4847%	8.6052%	8.5646%	8.3600%
June	10.3973%	21.0823%	8.5730%	10.3973%	6.8508%	8.2122%	8.0702%	8.9112%	7.7065%
July	14.0100%	28.4780%	9.6095%	14.0100%	6.7864%	8.4883%	8.6451%	9.4239%	6.7712%
August	13.3207%	27.0766%	9.6095%	13.3207%	7.0565%	8.4840%	8.5653%	9.4212%	6.3688%
September	6.6759%	12.6605%	8.4277%	6.6759%	7.3792%	8.2136%	8.3032%	8.4971%	6.9373%
October	3.7011%	1.8472%	8.2582%	3.7011%	8.4539%	8.4869%	8.6052%	8.5653%	7.9644%
November	5.9593%	0.1444%	7.8465%	5.9593%	8.9880%	8.2122%	8.1088%	7.8717%	8.4752%
December	10.6937%	0.1222%	7.9579%	10.6937%	9.8312%	8.4915%	8.6619%	7.9204%	9.9577%

End-Use Category Energy to Coincident Peak Demand Factors

	Building Shell	**Cooling**	**Freezer**	**HVAC**	**Lighting**	**Miscellaneous**	**Pool Spa**	**Refrigeration**	**Water Heating**
	0.0004660805	0.0009474181	0.0001685722	0.0004660805	0.0001492529	0.0001148238	0.0002354459	0.0001285253	0.0000887318

Source: Ameren Missouri 2016-2018 Energy Efficiency Plan. MPSC file number EO-2015-0055 Appendix E to evaluated energy savings.

Appendix B. Demographics of Survey Respondents

Table 57 shows the most frequent answers to each demographic question asked in the student family participant survey.

Table 57. Demographics

Demographic	Most Frequent Answer	Percentage
Are you an Ameren Missouri Customer?	Yes	86%, n=400
How many people live in your house?	Four	38%, n=397
Primary heating fuel	Natural Gas	56%, n=396
Water heating fuel*	Natural Gas	57%, n=386
How many showers are in your home?	Two	47%, n=397
How many kitchen faucets are in your home?	One	84%, n=400
How many bathroom faucets are in your home?	Three or more	54%, n=400
* 40% of the respondents answered that their water is heated with electricity (n=386)		

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Appendix D. Stakeholder Interview Guide

Ameren Missouri Energy Efficiency Kits
Stakeholder Interview Guide PY16

Respondent name:_____

Respondent phone: _____

Interview date: _____ Interviewer initials: _____

For the PY16 evaluation, Cadmus will interview stakeholders annually. The interview will focus on PY16 program changes and identify recommendations for improving subsequent program years.

Roles and Responsibilities

1. Please describe your role and responsibilities for Ameren Missouri's Energy Efficiency Kits Program?
2. Who do you coordinate with regarding the program? [Probe: internal and external program stakeholders]
3. What types of communication do you have with these program stakeholders (i.e., formal or informal)?
4. How are the roles defined between ICF, NEF, and Ameren?
5. What types of communication do you have with these program stakeholders (i.e., formal or informal)? [Probe: frequency, satisfaction, challenges, etc.]

Program Goals

6. Appendix B[17] showed an estimated annual savings target of 6,194 MWh and 1.01MW and a goal of 91,157 measure installations, are these the current goals?
    a. How were these goals determined?
    b. Are these goals divided between the two delivery channels: school kits and multifamily kits?
    c. How is the measure installation number derived?
    d. Are there benchmarks in place to monitor progress throughout the year? If so, what are they [and how will they be measured]?
    e. Have you identified triggers to signal when goals are not being met and contingency plans in case this happens?

[17] State of Missouri. "In the Matter of Union Electric Company d/b/a Ameren Missouri's 2nd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA." File No. EO-2015-0055. February 5, 2016. Refer to Appendix B.

Changes to Program Design and Implementation

7. There have been a number of changes to the Energy Efficiency Kits program since PY15, could you tell me a little about the reasons for each of the following changes:
    a. Discontinuing single family kits delivery channel?
    b. Continuing with multifamily kits delivery channel?
    c. Adding school kits delivery channel?
8. Have there been any other program changes since PY15?
    a. [IF YES] Can you describe the changes and reasons for the changes?
9. For the multifamily kits delivery channel, apart from kit items changing, have there been any program design or implementation changes between PY15 and PY16?

PY16 Program Design and Implementation: School-based delivery channel

10. How do schools qualify to participate in the program?
    a. Can schools participate multiple years or only once?
    b. If multiple years are allowed, have you considered sibling participation?
11. How is the school-based delivery channel marketed?
    a. Who do you work with at each of the schools? [Probe: Teachers? Administrators? Both?]
    b. How did you decide on the kit contents?
12. In your opinion, should any additional measures be considered for inclusion in future kits?
13. Conversely, should any measures be excluded in future kits?
14. What was the process for developing the energy education curriculum included with the kits? What is the purpose of the energy education curriculum?
15. Have you received any feedback from school teachers or administrators about the program?
16. How are the results from the student kit survey used?
    a. Is there a survey for the teachers? If yes, how are the results from this survey used?

Program Tracking: School Kits Delivery Channel

17. What tools or systems are in place to track program activities?
    a. Who is responsible for maintaining program data (ICF, NEF, Ameren Missouri)? Who is responsible for updating program data?
        i. How are the kits tracked for each program?
        ii. Are kit surveys traceable to kits
        iii. Are kits traceable to teachers and/or schools?
18. Since the school year is different than the program year, has this caused any issues?
19. Who orders the kits on behalf of the school?
    a. How long does it take for kits to arrive?

20. How do you decide how many kits a school needs?
    a. After calculating the number of kits, what type of auditing/verification do you preform, if any?
    b. Are there systems in place to prevent schools from receiving too many or too few kits?
21. What happens when items are not installed? [Probe: are they mailed back?]

PY16 Program Design and Implementation: Multifamily Kit Delivery Channel (NOT NEF)

22. How do property managers qualify to participate in the program?
    a. Can property managers participate multiple years or only once? If allowed, what is the theory behind multiple years?
    b. How is property manager participation tracked?
23. How is the multifamily kit delivery channel marketed?
    a. How did you develop a list of property managers to contact?
24. How did you decide on the kit contents?
    a. In your opinion, should any additional measures be considered for inclusion in future kits?
    b. Conversely, should any measures be excluded in future kits?
25. Have you received any feedback from property managers or their tenants about the program?
26. Is there a survey for property managers or tenants?
    a. If yes, how are the results from this survey used?

Program Tracking: Multifamily Kits Delivery Channel (NOT NEF)

27. What tools or systems are in place to track program activities?
    a. Who is responsible for maintaining program data (ICF, Ameren Missouri)? Who is responsible for updating program data?
28. Are property managers sent complete kits or individual kit items in bulk?
    a. How long does it take for (kits/kit items) to arrive?
29. How do you decide how may (kits/kit items) a property manager needs?
    a. After calculating the number of (kits/kit items), what type of auditing/verification do you preform, if any?
    b. Are there systems in place to prevent property managers from receiving too many or too few (kits/kit items)?
30. What happens when items are not installed? [Probe: are they mailed back?]

Successes, Challenges, Suggestions for Improvement

31. What would you say is working particularly well so far in PY16? Why is that?
32. Conversely, what is not working as well as anticipated? Why is that?

33. Overall, do you have any suggestions for how to improve the program?
    a. Do you anticipate any areas that might need improvement next year?
34. What changes are being planned or considered for PY17?

Wrap Up

35. Do you have any specific questions that you want to make sure are included in the parent survey, property manager survey, or in the teacher interviews?
36. Those are all the questions I have for you. Is there anything else you would like to add or questions you'd like to ask?

Appendix E. School Administrator Interview Guide, Student Family Survey, Nonparticipant Spillover Survey Data

Ameren Missouri Energy Efficiency Kits
School Administrator Interview Guide PY16

Respondent name: _____

Respondent phone: _____

Interview date: _____ Interviewer initials: _____

In PY16 Cadmus will interview eight school administrators, including teachers, to gain insights into program delivery and program effectiveness and better understand their experiences participating in the program.

Email Invitation

To: [EMAIL]
From:
Subject: Interview about Ameren Missouri *Take Action Kits*

Hello [CONTACT NAME],

Our records indicate your school participated in Ameren Missouri's Energy Efficiency School Kits Program, which provides teachers at participating schools with *Take Action Kits* and curriculum for 6th grade students. We are interviewing teachers and school administrators who participated in the program in 2016.

I would like to set up a time to speak with you or a colleague regarding the Energy Efficiency School Kits Program. The interview should take about 30 minutes. Ameren Missouri will use your responses to improve school energy efficiency programs offered in your area.

Please forward this email to a colleague if they are more familiar with the Energy Efficiency School Kits Program.

If you are the best person to speak to, please let me know a date and time when you are available.

I appreciate your time and help with this. I look forward to speaking with you.

Calendar Invite

To: [EMAIL]

From:
Subject: Interview about the Ameren Missouri *Take Action Kits*

Hello [CONTACT NAME],

Thank you for agreeing to speak with me about the Ameren Missouri Energy Efficiency School Kits Program. Our call is scheduled for [INSERT TIME AND DATE OF CALL] and will take about 30 minutes.

I have attached a copy of the interview guide to review prior to our call so you are familiar with the questions.

If you wish to reschedule, please let me know.

Thank you. I look forward to speaking with you.

Introduction – Scheduled Interview via Email

Thank you for making the time to speak with me. Cadmus is conducting interviews with teachers and administrators from schools that received *Take Action Kits* from Ameren Missouri.

[IF ASKED FOR FURTHER DETAIL] Our records indicate your school participated in Ameren Missouri's Energy Efficiency School Kits Program, which provides teachers at participating schools with *Take Action Kits* and curriculum for 6th grade students. We are interviewing teachers and school administrators who participated in the program in 2016.

[IF NO INTERVIEW SCHEDULED]

Introduction did not schedule interview via email

Hello, my name is **[INTERVIEWER]** and I'm calling on behalf of Ameren Missouri to discuss the *Take Action Kits* and curriculum Ameren Missouri sent to your school. May I please speak with **[NAME]**?

[IF ASKED FOR FURTHER DETAIL] Our records indicate your school participated in Ameren Missouri's Energy Efficiency School Kits Program in which teachers at participating schools receive *Take Action Kits* and curriculum to teach to their 6th grade students. We are interviewing teachers and school administrators who participated in the program in 2016.

[IF ASKED FOR INTERVIEW LENGTH OR USE] The interview should take about 30 minutes. Ameren Missouri will use your responses to improve school energy efficiency programs offered in your area.

Screener

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Suite 400
Portland, OR 97205
Voice: 503.467.7100
Fax: 503.228.3696

1) Our records indicate that **[SCHOOL NAME]** participated in Ameren Missouri's Energy Efficiency School Kits Program, which provides teachers at participating schools with *Take Action Kits* and curriculum for 6th grade students. Is that correct? **[DO NOT READ; PROMPT ONLY IF NECESSARY]**

    a. (Yes)
    b. (No) **[THANK AND TERMINATE]**
    c. (Don't know) **[ASK FOR SOMEONE FAMILIAR WITH PROGRAM; REINTRODUCE]**

Awareness + Kit Orders

2) What is your role at **[SCHOOL NAME]**?

3) How did you learn about the Energy Efficiency School Kits Program?

4) Why did you decide to participate in the program?

5) Did you order the *Take Action Kits* on behalf of the school?

[IF Q5) = NO then SKIP to Q10)]

6) How did you decide the number of kits to order? (i.e. one per 6th grader?)

7) How long did it take for the kits to arrive? Did it take longer than anticipated?

8) Who was **[SCHOOL NAME]**'s liaison at National Energy Foundation (NEF) [IF NEEDED: "Schools were contacted on behalf of Ameren Missouri by a National Energy Foundation representative who handled all Energy Efficiency School Kits logistics including ordering and delivery of the kits"]?

9) Was the NEF representative able to efficiently answer any questions you may have had about *Take Action Kits* logistics or regarding the curriculum? **[IF UNSATISFIED:]** How could Ameren Missouri improve NEF's administration of the Energy Efficiency School Kits program?

Energy Education Curriculum

[IF ROLE = SCHOOL ADMINISTRATOR then SKIP to Q Error! Reference source not found.**]**

10) Did you teach your students the energy efficiency curriculum included with the kits?
    a. **[IF NO:]** Why not? **[then SKIP to Q14)]**

11) Which curriculum topics, if any, were most challenging for you to teach? Why? How could Ameren Missouri improve the curriculum or materials to make it easier for you?

12) Similarly, which curriculum topics, if any, did the students have trouble understanding? Why?

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13) Overall, do you think the lessons taught to the students were effective? What kinds of lessons would you like to see added to or removed from the curriculum?

Classroom Materials

In addition to the curriculum, the participating teachers received many other materials for the classroom, including a teacher's guide, a DVD, posters and fliers, wristbands for the students, and a program evaluation form.

14) In what ways did the Teacher's Guide help you teach the curriculum?

15) Which parts of the Teacher's Guide, if any, were confusing or challenging for you to use?

16) In your opinion, which activities in the Teacher's Guide were most effective? Least effective?

17) Did you play any of the DVD content for your students?

    a. **[IF NO:]** Why not? **[SKIP to Q20)]**

18) Did you play the DVD's Introductory Presentation?

19) Did your students complete the optional DVD Pre- and Post- surveys? **[IF YES:]** Did you find them helpful for gauging your students' knowledge before and after the program?

20) Did you hang the educational posters in your classroom?

    a. **[IF YES:]** How did they benefit you and your students?

    b. **[IF NO:]** Why not?

21) Did you give out the Think! Talk! Take Action! wristbands to your students?

    a. **[IF YES:]** How did the students respond to the wristbands?

    b. **[IF NO:]** Why not?

22) Did you visit Ameren Missouri's website?

    a. **[IF YES:]** Why did you visit the website? Did you find it helpful?

23) How can Ameren Missouri improve the classroom materials we discussed?

24) Thinking about the program in the future, what kinds of program materials would you like to see included with the kits? Which existing materials could be removed?

Energy Efficiency Kit Items and Installation Instructions

After learning about the *Take Action Kits* in class, students were asked to install the items from the kits in their homes.

25) Did your students report having trouble installing any items? **[IF NO then SKIP to Q28)]**

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26) Did the instructions and materials provided help answer student questions and concerns?

27) How could these instructions and materials be improved to better help you?

28) Thinking about the program in the future, what kinds of items would you like to see included in the kits? Which existing items could be removed?

29) The kits included Student Guides for the students to share with their families. What feedback did you receive about the guides from students or parents?

30) What other feedback did you receive from students (and teachers) about the kit items?

Home Energy Worksheet

Teachers were asked to distribute Home Energy Worksheets for students and families to complete after installing the kit items in their homes. Ameren Missouri offered $50 to classrooms where teachers returned at least 80% of the completed Home Energy Worksheets.

31) **[IF HEW RETURN RATE = 0]** Did you know that Home Energy Worksheets were provided with the kits?

    a. **[IF YES, continue to 32)]**

    b. **[IF NO, ask]** Do you have any suggestions for making sure teachers and students are aware of the Home Energy Worksheets? **[Record answer and SKIP to 39)]**

32) Were you aware you could receive $50 for returning the Home Energy Worksheets?

33) Do you think this amount is an adequate motivator? Why or why not?

34) Did your class return any of the Home Energy Worksheets? Why or why not?

35) Did you have any difficulty motivating students to return the filled in Home Energy Worksheet?

    a. **[IF YES]** What was the difficulty?

    b. **[IF YES]** Do you have any suggestions for how to increase the return rate of the Home Energy Worksheet?

36) **[IF HEW RETURN RATE < 100%]** Did you have any difficulty turning in the Home Energy Worksheets to Ameren Missouri?

    a. **[IF YES]** What was the difficulty?

    b. **[IF YES]** Do you have any suggestions to make this process easier?

37) What feedback did you receive from students (or teachers) about the Home Energy Worksheets?

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38) How could Ameren Missouri improve the Home Energy Worksheet?

Successes and Suggestions for Improvement

39) Would you recommend this program to other teachers or schools? Why or why not?

40) How could Ameren Missouri encourage other schools to participate in this program?

41) If given the opportunity, would you participate again?

Wrap Up

42) Those are all the questions I have for you. Is there anything we did not discuss that you would like to add or questions you'd like to ask?

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CADMUS

Ameren Missouri 2016 Online Survey Template: School Survey

This survey will gather data to estimate freeridership, spillover and assess any changes in installation of school kit items. To avoid duplication of effort, this survey, wherever possible, will not ask for information that has already been gathered by ICF on Home Energy Worksheets. The Home Energy Worksheet asks participants how many kit items they installed, their satisfaction with the program, and questions about the participant's home including number of occupants.

Topic	Researchable Questions	Item
Screener		*Section A*
Satisfaction with Program and Kit Items	How satisfied are participants with the program and the kit items? Do participants have suggestions for improving the program?	*Section B*
Installation Rates	What are the installation rates of the various measures? How easy was the process of installing the measures?	*Section C*
Satisfaction with Ameren Missouri	How satisfied are participants with Ameren Missouri?	*Section D*
Free ridership	Would the participant have purchased the product without the program?	*Section E*
Spillover	Did the Ameren program influence the participant purchase any other energy-efficient equipment?	*Section F*
Demographics	Participant Demographics	*Section G*

Target Quota = Census of Collected Data

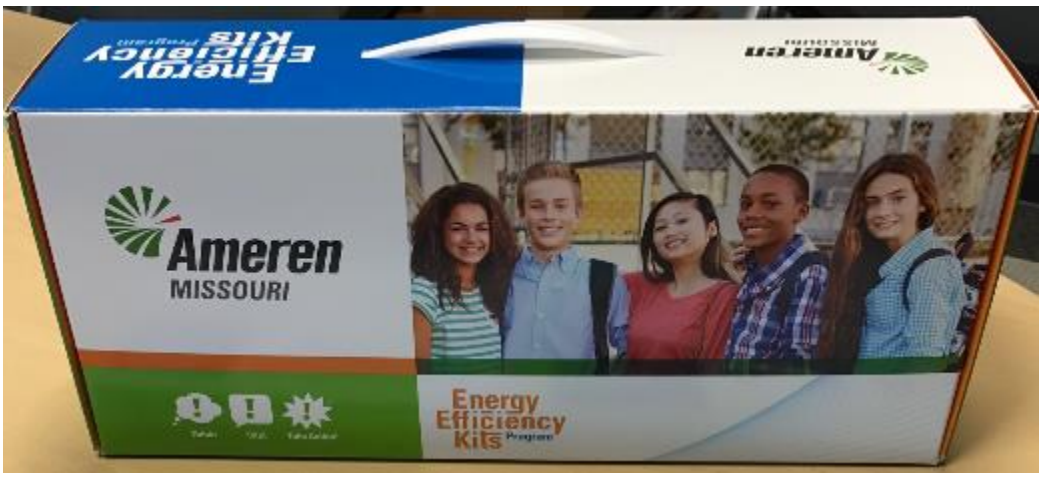
General Instructions

- Open-ended responses are in green **[LIKE THIS]**
- Programming instructions are in red **[LIKE THIS]** (not visible to the respondents)
- Skipped responses are not visible (99 = code for nothing selected/skipped question)

Variables to be Pulled into Survey

- **[SCHOOL NAME]** = The name of the school their student attends
- **[LED QTY]** = quantity of LEDs (0 to 4)
- **[SHOWERHEAD]** = measure status from tracking data (1, 2, 3 or 99)
- **[KITCHAER]** = measure status from tracking data (1, 2, 3 or 99)
- **[BATHAER]** = measure status from tracking data (1, 2, 3 or 99)
- **[WHISTLE]** = measure status from tracking data (1, 2, 3 or 99)
- **[HWPWRAP]** = measure status from tracking data (1, 2, 3 or 99)

A. Screener



A1. Thank you for participating in **Ameren Missouri's Energy Efficiency School Kits Program**. We would like to know more about your experience with the program. Our records indicate that your family received an Energy Efficiency Kit from **[SCHOOL NAME].** Is this correct? **[FORCED RESPONSE (NO SKIP)]**

1. Yes, I received an Energy Efficiency Kit
2. No, I did not receive Energy Efficiency Kit **[TERMINATE TEXT: We are only surveying customers who received Energy Efficiency Kits at the present time, but Ameren Missouri appreciates you for taking time to respond. Thank you. Have a nice day!**

A2. *Are you or any members of your household employed by Ameren Missouri? **[FORCED RESPONSE, NO SKIP OR DON'T KNOW]**

1. Yes, I or someone in my household works for Ameren Missouri **[TERMINATE TEXT: We are not surveying Ameren Missouri employee households, but we appreciate you for taking time to respond. Thank you. Have a nice day!]**
2. No, no one in my household works for Ameren Missouri

A3. Is Ameren Missouri your electricity provider?

1. Yes
2. No
98. Don't Know
99. (Skipped)

B. Satisfaction with Program and Kit Items

First, I'd like to know more about your satisfaction with Ameren Missouri's Energy Efficiency Kits School Program.

B1. For the following statement, check the box that corresponds with whether you strongly agree, somewhat agree, agree, somewhat disagree, or strongly disagree with the following statement: **[RECORD 1=STRONGLY AGREE, 2=SOMEWHAT AGREE, 3=AGREE, 4=SOMEWHAT DISAGREE, 5=STRONGLY DISAGREE, 98=DON'T KNOW, OR 99=REFUSED FOR THE STATEMENT]**

1. "I am satisfied with my child's experience in the Ameren Missouri Energy Efficiency Kits School Program."

B2. **[ASK IF B1=1,2,3,4, OR 5]** Why do you **[RATING FROM B1]** with the statement?
[OPEN ENDED RESPONSE:_____]

B3. Would you like to see this program continued in local schools?

1. Yes
2. No
98. Don't Know
99. Skipped

B4. Do you remember completing activities from the *Student Guide*? These activities may have included recording types of bulbs you use in your home, testing the flow rate of your existing and new showerhead, discussing any phantom loads (devices that use power even when they are turned off)?

1. Yes
2. No

B5. **[IF B4=1]** For the following statements please check the box that corresponds with whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with the following statements. **[MULTIPLE OPTIONS 1=STRONGLY AGREE, 2=SOMEWHAT AGREE, 3=SOMEWHAT DISAGREE, 4=STRONGLY DISAGREE, 98=DON'T KNOW, OR 99=REFUSED FOR EACH STATEMENT] [RANDOMIZE ORDER]**

1. The activities in the *Student Guide* were fun to complete.
2. The activities in the *Student Guide* were relevant to my home.
3. By completing the activities in the *Student Guide* my family learned about our home's energy use.
4. By completing the activities in the *Student Guide* my family learned how to use energy wisely.
99. Skipped

B6. Do you remember receiving written information in your kit on how to install the energy efficient items in your home?

1. Yes
2. No

B7. **[IF B6=1]** How useful did you find the installation instructions that were provided in the kit?

1. Very useful
2. Useful
3. Not too useful
4. Not useful at all
5. Not applicable – I have not installed any items yet **[SKIP SECTION C INSTALLATION RATES AFTER END OF SECTION B]**

98. Don't know
99. Skipped

B8. **[IF B7=3,4]** Why do you say that?

[SPECIFY:_____]

B9. For each Energy Efficiency Kit item below, select a rating for how satisfied you are with that kit item. **[SINGLE RESPONSE; DROP DOWN MENU THAT DOES NOT REPEAT THE REPONSE OPTIONS]**

Question	Energy Efficiency Kit Item	Very Satisfied	Somewhat Satisfied	Not Too Satisfied	Not Satisfied At All	Don't Know
B9a.	High-efficiency showerhead					
B9b.	High-efficiency kitchen faucet aerator					
B9c.	High-efficiency bathroom faucet aerator					
B9d.	LED Light Bulbs					
B9e.	Dirty furnace filter whistle					
B9f.	Hot water pipe insulation					
B9g.	Shower timer					
B9h.	"Turn it Off" Stickers					

B10. **[IF FOR** B9**A. TO** B9**H. ANSWERED NOT TOO SATISFIED OR NOT SATISFIED AT ALL]** Why are you **[ANSWER FROM** B9**A. TO** B9**H.]** with the **[INSERT ENERGY EFFICIENCY KIT ITEM** B9**A. TO** B9**H.]**?

[SPECIFY:_____]

B11. *What suggestions, if any, do you have for improving this program? Please write your suggestions in the box below.

[OPEN ENDED RESPONSE: _____]

C. *Installation Rates*

Each Energy Efficiency Kit contains the following energy efficient items for you to install in your home, in addition to other materials and installation instructions:

- Four ENERGY STAR © certified LED bulbs
- One high-efficiency showerhead
- One high-efficiency kitchen faucet aerator
- One high-efficiency bathroom faucet aerator
- One dirty furnace filter whistle
- Hot water pipe insulation (3 feet)

We'd like to now follow up with you on the installation of the Energy Efficiency Kit items.

C1. **[IF ANY IMPORTED MEASURE FIELDS = 1; IF LED QTY ≥1]** In the Home Energy Worksheet you'd indicated that you installed the following items. How many of these items are still installed?

Question	Energy Efficiency Kit Item	Quantity installed	How many of these items are still installed?
C1a.	**[IF SHOWERHEAD=1]** High-efficiency showerhead	1	____
C1b.	**[IF KITCHAER=1]** High-efficiency kitchen faucet aerator	1	____
C1c.	**[IF BATHAER=1]** High-efficiency bathroom faucet aerator	1	____
C1d.	**[IF WHISTLE=1]** Dirty Furnace filter whistle	1	____
C1e.	**[IF HWPWRAP=1]** Hot water pipe insulation	1	____
C1f.	**[IF LED QTY≥1]** Led Bulb(s)	[LED QTY]	LED QTY FINAL

C2. **[ASK FOR EACH ITEM IN C1 WHERE "QUANTITY INSTALLED ≠ "HOW MANY OF THESE ITEMS ARE STILL INSTALLED" OR LED QTY FINAL LESS THAN LED QTY]** Why did you remove the [INSERT ITEM NOT INSTALLED]?

1. It broke **[OR ALTERNATE FOR LEDS]:** The bulb(s) broke or burned out
2. I didn't need it **[OR ALTERNATE FOR LEDS]:** I didn't need them
3. Other **[SPECIFY:_____]**

98. Don't Know
99. Skipped

C3. **[IF ANY IMPORTED MEASURE FIELDS = 2,3,99; IF LED_QTY < 4]** In the Home Energy Worksheet, you indicated that the following items were not installed or you left the answer blank. Please check the appropriate box below to indicate if you have since installed the item(s).

Question	Energy Efficiency Kit Item	Quantity not installed	How many of these have been installed now?
C3a.	**[IF SHOWERHEAD=2,3,99]** High-efficiency showerhead	1	____
C3b.	**[IF KITCHAER==2,3,99]** High-efficiency kitchen faucet aerator	1	____
C3c.	**[IF BATHAER==2,3,99]** High-efficiency bathroom faucet aerator	1	____
C3d.	**[IF WHISTLE==2,3,99]** Dirty furnace filter whistle	1	____
C3e.	**[IF HWPWRAP==2,3,99]** Hot water pipe insulation	1	____
C3f.	**[IF LED QTY<4]** Led Bulb(s)	[4 MINUS **LED QTY**]	____ **[LED QTY FINAL]**_

C4. **[IN C3 IF "QUANTITY NOT INSTALLED" ≠ "INSTALLED NOW" OR (LED QTY FINAL) LESS THAN (4 MINUS LED QTY)]** Why didn't you install **[FOR LEDS ONLY ADD "**all of**"]** the Energy Efficiency Kit **[INSERT ITEM NOT INSTALLED]**? Check all that apply. **[MULTIPLE RESPONSES, CHECK ALL THAT APPLY]**

1. It was difficult to install
2. I didn't need it
3. I plan to install it later
4. Other **[SPECIFY:**_____**]**

98. Don't Know
99. Skipped

C5. **[IF C4=1]** What was difficult about installing the Energy Efficiency Kit **[INSERT ITEM NOT INSTALLED]**? Check all that apply. **[MULTIPLE RESPONSES, CHECK ALL THAT APPLY]**

1. The item is of poor quality
2. The item did not fit or could not be installed in my home
3. My home already has the item
4. We did not have the proper tools for installation
5. Other **[SPECIFY:_____]**

98. Don't Know
99. Skipped

C6. **[ASK FOR EACH ITEM IN C3 IF "QUANTITY NOT INSTALLED" ≠ "INSTALLED NOW" OR LED QTY FINAL LESS THAN LED QTY]** What did you do with the **[INSERT ITEM NOT INSTALLED]** that you did not install? **[FOR LEDS, ALLOW MULTIPLE RESPONSE AND ADD:]** Please check all that apply.

1. Gave it to someone else **[OR ALTERNATE FOR LEDS]:** Gave them to someone else
2. Kept it but haven't used it **[OR ALTERNATE FOR LEDS]:** Kept but haven't used them
3. Thrown away or recycled it **[OR ALTERNATE FOR LEDS]:** Thrown away or recycled them

98. Don't Know
99. Skipped

D. Participant Satisfaction with Ameren Missouri

Next, I'd like to know more about your experiences with Ameren Missouri as your utility.

D1. *Thinking about your overall experiences with Ameren Missouri as your utility, how satisfied would you say you are with Ameren Missouri?

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not at all satisfied

98. Don't know
99. Skipped

D2. **[ASK IF D1 = 1, 2, 3 OR 4]** Why are you **[ANSWER FROM D1]** with Ameren Missouri?
[OPEN ENDED RESPONSE: _____]

D3. Based on your experience with this program, would you say your satisfaction with Ameren Missouri has:

1. Increased
2. Stayed about the same
3. Decreased
98. Don't Know
99. (Skipped)

E. Free Ridership

E1. Would you have purchased and installed any of the Energy Efficiency Kit items in your home if you had not received them in your kit from Ameren Missouri?

1. Yes **[CONTINUE TO E2]**
2. No **[SKIP TO E3]**
3. I would have purchased some items, but not all **[SKIP TO E4]**
98. Don't Know
99. Skipped

E2. **[IF E1=1, 98, 99]** Would have you have purchased and installed the same type and number of each item in the Energy Efficiency Kit?

1. Yes **[SKIP TO E6]**
2. No **[SKIP TO E4]**
98. Don't know **[SKIP TO E4]**
99. Skipped **[SKIP TO F1]**

E3. **[IF E1 =2]** To confirm, you would not have purchased and installed any Energy Efficiency Kit items at all, is that correct?

1. Yes, correct **[SKIP TO F1]**
2. No **[CONTINUE TO E4]**
98. Don't know **[CONTINUE TO E4]**
99. Skipped **[SKIP TO F1]**

E4. Which Energy Efficiency Kit items would you have purchased and installed? Check all that apply.
[MULTIPLE RESPONSES, CHECK ALL THAT APPLY]

1. High-efficiency showerhead
2. High-efficiency kitchen faucet aerator
3. High-efficiency bathroom faucet aerator
4. LED Light Bulbs
5. Dirty furnace filter whistle
6. Hot water pipe insulation
7. Shower timer

98. Don't know
99. Skipped

E5. **[IF E4=4]** The Energy Efficiency Kit came with four LED light bulbs. How many LEDs would you have purchased and installed without the kit?

1. **[OPEN ENDED NUMERIC RESPONSE: _____]**

98. Don't know
99. Skipped

E6. And thinking about timing, without the free kit from Ameren Missouri, check the box that represents when you would most likely have purchased and installed each Energy Efficiency Kit item… **[SINGLE RESPONSE]**

Question	Logic	Energy Efficiency Kit Item	At the same time you received the kit	Later, but within the same year	More than on year out	Never	Don't know
E6a.	**E2=1 OR E4=1**	High-efficiency showerhead					
E6b.	**E2=1 OR E4=2**	High-efficiency kitchen faucet aerator					
E6c.	**E2=1 OR E4=3**	High-efficiency bathroom faucet aerator					
E6d.	**E2=1 OR E4=4**	LED Light Bulbs					
E6e.	**E2=1 OR E4=5**	Dirty Furnace Filter Whistle					
E6f.	**E2=1 OR E4=6**	Hot water pipe insulation					
E6g.	**E2=1 OR E4=7**	Shower Timer					

F. Spillover

F1. Since participating in the Energy Efficient School Kits program, have you added any other energy-efficient products in your home or performed any additional energy-saving activities that were not discounted through Ameren Missouri?

1. Yes
2. No [**SKIP TO NEXT SECTION**]
98. Don't Know [**SKIP TO NEXT SECTION**]
99. (Skipped) [**SKIP TO NEXT SECTION**]

F2. **[IF F1=1]** Please select the energy-saving activities you've pursued since your experience with Ameren Missouri's Energy Efficient School Kits program. [**RANDOMIZE ORDER, CHECK ALL THAT APPLY**]

1. Had a home audit
2. Recycled a refrigerator or freezer
3. Constructed an Energy Star New Home
4. Purchased and installed efficient Light fixtures or ceiling fan
   a. How many of these are currently installed in your home? [**SPECIFY:** __]
5. Purchased and installed an efficient refrigerator
6. Purchased and installed an efficient freezer
7. Purchased and installed an efficient clothes washer
8. Purchased and installed an efficient dishwasher
9. Purchased and installed an efficient room air conditioner
   a. How many did you purchase and install? [**SPECIFY:**__]
10. Purchased and installed Energy efficient electronics (e.g. TV, DVD, computer)
11. Purchased and installed an Efficient room air purifier
    a. How many did you purchase and install? [**SPECIFY**: __]
12. Purchased and installed an Efficient pool pump
13. Purchased and installed an Efficient dehumidifier
14. Purchased and installed an Efficient water heater (other than heat pump water heater)
15. Purchased and installed Efficient showerheads
    a. How many did you purchase and install in your home? [**SPECIFY:** _____]
16. Purchased and installed Efficient faucet aerators
    a. How many did you purchase and install in your home? [**SPECIFY**: _____]

17. Purchased and installed an Efficient central air conditioner
18. Purchased and installed an Air source heat pump
19. Purchased and installed a Geothermal heat pump
20. Purchased and installed a Ductless heat pump
21. Purchased and installed a Dual-fuel heat pump
22. Purchased and installed an Efficient Furnace fan
23. Purchased and installed a Heat pump water heater
24. Purchased and installed a Programmable (but not "smart") thermostat
25. Purchased and installed a Learning or "smart" thermostat
26. Purchased and installed Insulation
27. Purchased and installed Efficient Windows
28. Purchased and installed Solar panels
29. Other items
    a. Please specify: [**SPECIFY**: _____]

98. Don't Know [**SKIP TO NEXT SECTION**]
99. (Skipped)

[PRESENT THIS MESSAGE IF F1=1 AND NOTHING SELECTED IN F2]
You did not check any products or services for the last question.
If you did pursue additional energy-savings activities since receiving the kit, please use the back arrow below to return to that question and select one or more answers (select "other items" if you do not see your products or services on the list).
If you did NOT purchase and install any energy-efficient products or services, please use the forward arrow below to continue the survey.

F3. **[Ask if F2=1]** What kind of changes did you make to your home as a result of the audit?

1. [**RECORD RESPONSE:**_____]
99. (Skipped)

F4. **[Ask if F2=24 or 25]** What kind of thermostat did you replace with the ["programmable thermostat" or "smart thermostat (may be called a learning thermostat)" from F2]?

1. **[IF F2=26 "ANOTHER"]** Smart thermostat (may be called a learning thermostat)
2. **[IF F2=25 "ANOTHER" OR IF F2=26 "A"]** Programmable (but not "smart") thermostat
3. Manual thermostat
98. Don't Know
99. (Skipped)

F5. [Ask if F2=4, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, F2.20, 21, 22, 23, 26, 27 – ask for each] How do you know that the [F2 RESPONSE] is energy efficient?

1. ENERGY STAR brand
2. Efficiency rating [RECORD NUMERIC RESPONSE:_____]
3. Other [RECORD RESPONSE:_____]
98. Don't Know
99. (Skipped)

F6. [ASK if F2 = 26] How many square feet of insulation did you have installed?

1. [RECORD NUMERIC RESPONSE:_____]
99. (Skipped)

F7. [ASK if F2 = 27] How many square feet of windows did you have installed?

1. [RECORD NUMERIC RESPONSE:_____]
99. (Skipped)

F8. [ASK if F2 = 26] In what location in your home was the insulation installed?

1. [RECORD RESPONSE:_____]
99. (Skipped)

F9. [ASK if F2 = 27] In what location in your home were the windows installed?

1. [RECORD RESPONSE:_____]
99. (Skipped)

F10. [ASK ONCE FOR EACH ITEM CHECKED IN F2] Why did you choose to purchase or install the items listed below? [INSERT TABLE OF CHECKED RESPONSES FROM F2]

1. [RECORD RESPONSE]:_____
99. (Skipped)

F11. Did you receive a rebate, discount, or tax credit for any of the items listed below? (If yes, check all that apply.) [INSERT TABLE OF CHECKED RESPONSES FROM F2 – ALLOW MULTIPLE RESPONSE]

1. Yes, from Ameren Missouri
2. Yes, from another organization
3. No
98. Don't Know
99. (Skipped)

F12. **[ASK FOR EACH ITEM WHERE F11 = 2]** What organizations besides Ameren Missouri paid the rebates, or provided discounts or tax credits for the items listed below? **[INSERT TABLE OF CHECKED RESPONSES FROM F2]**

Please specify: [**RECORD RESPONSE:**_____]

F13. **[FOR MEASURES for which Ameren provides incentives (F2.9, F2.11, F2.12, 17, 18, 19, 20, 21, 22, 23, 25), ASK FOR EACH ITEM WHERE F11= 2 or 3]** Why didn't you apply for a rebate from Ameren Missouri for the purchase of your **[F2 RESPONSE]**?

1. **[RECORD RESPONSE]**:_____
99. (Skipped)

F14. How important was your experience with the **Ameren Missouri's Energy Efficiency School Kits Program** on your decision to purchase or install the **[F2 RESPONSE]**? **[INSERT TABLE OF CHECKED RESPONSES FROM F2]**

1. Not at all important
2. Not too important
3. Somewhat important
4. Very important
98. Don't Know
99. (Skipped)

F15. **[ASK FOR EACH CHECKED ITEM FROM F2]** Prior to purchasing or installing the items listed below, had you heard or read about the benefits of installing this equipment from Ameren Missouri or Ameren Missouri's Act on Energy campaign?

	Yes (1)	No (2)	Don't know (98)
[INSERT 1st CHECKED RESPONSE FROM F2]			
[INSERT 2nd CHECKED RESPONSE FROM F2]			
[INSERT 3rd CHECKED RESPONSE FROM F2]			
[INSERT 4th CHECKED RESPONSE FROM F2]			

F16. **[ASK FOR EACH YES RESPONSE IN F15]** How important was the information Ameren Missouri provided about the energy efficiency or money saving benefits of in your decision to purchase or install the items listed below? **[INSERT TABLE OF ALL "YES" RESPONSES FROM F15]**

1. Not at all important
2. Not too important
3. Somewhat important
4. Very important
98. Don't Know
99. (Skipped)

G. Demographics

We are almost finished! There are just a few final questions that will help us with our analysis.

G1. How many people live in your home?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven or more
8. I prefer not to answer this question

99. Skipped

G2. Which of the following best describes your home or residence? **[SELECT ONE RESPONSE]**

1. Single-family home (not a duplex, townhome, or apartment)
2. Manufactured or modular home
3. Mobile home
4. Row house or townhome
5. Two or three family attached residence
6. Apartment with four or more units
7. Condominium
8. Other
   a. Please specify: [**SPECIFY:** _____]

98. Don't Know
99. (Skipped)

G3. How do you cool your home? Please check all that apply. **[CHECK ALL THAT APPLY]**

1. Central Cooling System
2. Window AC
3. Mini-split
4. Heat pump
5. Package Terminal System (through wall unit)
6. I don't have or don't use cooling
7. Other
   a. Please specify: [**SPECIFY:** _____]

98. Don't know
99. (Skipped)

G4. Which of these fuels primarily heat your home?

1. Natural gas
2. Electricity
3. Other fuel
98. Don't know
99. (Skipped)

G5. **[G4=2]** What type of space heating equipment do you have?

1. Electric Furnace
2. Electric Heat Pump
3. Electric Baseboard
4. Other
   a. Please specify: [**SPECIFY:** _____]

98. Don't know
99. (Skipped)

G6. How is your water heated?

1. Natural Gas
2. Electricity
3. Other fuel
98. Don't know
99. (Skipped)

G7. How many showers are in your home?

1. One
2. Two
3. Three or more
98. Don't Know
99. Skipped

G8. How many kitchen faucets are in your home?

1. One
2. Two
3. Three or more
98. Don't Know
99. Skipped

G9. How many bathroom faucets are in your home?

1. One
2. Two
3. Three or more
98. Don't Know
99. Skipped

H. CLOSING

This completes the survey. We appreciate your participation and thank you for your time.

NONPARTICIPANT SURVEY RESPONSES

Measure Information					Criterion A: Familiarity with at least one Ameren Missouri program, rebate, or discount			Criterion B: At least one element of Ameren's program marketing and outreach motivated them to adopt the measure						Criterion C: They had a valid reason for considering the adopted measure energy efficient		Criterion D: For a like measure, they had not received a rebate from Ameren, and had not already tried to receive a rebate from Ameren, and they stated a valid reason for not applying for an Ameren rebate		Criterion E: They had a valid reason for deciding to install the measure		Criterion F: The adopted measure generated electric savings, not gas savings				Meeting all criteria
ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD000163256	G203	Efficient room air conditioner	Like	Phone	No	Yes	TRUE	4	Refused	Refused	Refused	FALSE	TRUE	The retailer/dealer/contractor told me it was	TRUE	beacuase I don't know how efficient it is	TRUE	because it was free and I didn't have any choice	FALSE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002669018	G208	Efficient kitchen faucet aerators	Like	Phone	Yes	Yes	TRUE	4	2	0	0	FALSE	TRUE	Galloons per minute used	TRUE	Not worth hassle.	TRUE	Part of the replacement of the faucet.	TRUE	Central air conditioner	Electric baseboard heat	Electric	TRUE	TRUE
CAD002723284	G208	Efficient kitchen faucet aerators	Like	Phone	Yes	Yes	TRUE	1	4	0	0	FALSE	TRUE	It's ENERGY STAR-certified	TRUE	Did not feel it was necessary	TRUE	Save Water	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002723284	G220	Learning or "smart" thermostat	Like	Phone	Yes	Yes	TRUE	3	1	0	0	TRUE	FALSE	NA		Same Reason; Did not feel it was necessary	TRUE	87 yr old mother who screws it up all of the time.	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002698885	G203	Efficient room air conditioner	Like	Phone	Yes	Yes	TRUE	3	3	0	0	TRUE	FALSE	It's ENERGY STAR-certified	TRUE	I wasn't sure my equipment qualified	TRUE	the one we had was too small	TRUE	Window or wall air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002175073	G207	Efficient showerheads	Like	Phone	Yes	No	TRUE	4	4	0	0	FALSE	TRUE	BOX SAID SO	TRUE	DIDN'T KNOW THE PROGRAM WAS AVAILABLE.	TRUE	IT WAS THE ONE I LIKED	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002788370	G207	Efficient showerheads	Like	Phone	Yes	Yes	TRUE	1	1	0	0	FALSE	FALSE	It does good and lowers the bill	TRUE	Just forgot about it	TRUE	To save energy	TRUE	Window or wall air conditioner	Gas furnace/boiler	Electric	TRUE	FALSE
CAD000196966	G203	Efficient room air conditioner	Like	Phone	Yes	Yes	TRUE	3	1	0	1	TRUE	FALSE	Just from what the paper work says.	TRUE	I didn't buy it through a contractor, I picked it up myself.	TRUE	Because it is the hottest room in the house and we wanted that it would cool the room off sooner.	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	TRUE
CAD002203571	G208	Efficient kitchen faucet aerators	Like	Phone	Yes	Yes	TRUE	2	3	0	2	TRUE	FALSE	Word of mouth.	TRUE	Time consumption.	TRUE	Conserve energy.	TRUE	None	Electric furnace	Electric	TRUE	TRUE
CAD002413700	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	2	2	2	2		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002413700	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	2	2	2	2		FALSE	NA				It was more precise.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD002421391	G229	Efficient Windows	Non-like	Phone	Yes	Yes	TRUE	4	3	1	1		TRUE	The retailer/dealer/contractor told me it was	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002530620	G224	Efficient freezer	Non-like	Phone	No	Yes	TRUE	4	4	4	0		TRUE	It's ENERGY STAR-certified	TRUE			NA		Air-source heat pump	Electric furnace	Electric	TRUE	TRUE

Measure Information					Criterion A: Familiarity with at least one Ameren Missouri program, rebate, or discount			Criterion B: At least one element of Ameren's program marketing and outreach motivated them to adopt the measure						Criterion C: They had a valid reason for considering the adopted measure energy efficient		Criterion D: For a like measure, they had not received a rebate from Ameren, and had not already tried to receive a rebate from Ameren, and they stated a valid reason for not applying for an Ameren rebate		Criterion E: They had a valid reason for deciding to install the measure		Criterion F: The adopted measure generated electric savings, not gas savings				Meeting all criteria
ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD002530620	G301	Removed a refrigerator or freezer	Non-like	Phone	No	Yes	TRUE	4	4	4	0		TRUE	NA				It was using up space and it was old.	TRUE	Air-source heat pump	Electric furnace	Electric	TRUE	TRUE
CAD002339649	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	4	4	0	0		TRUE	NA				was already installed when I moved in.	TRUE	Central air conditioner	[DO NOT READ] DON'T KNOWElectric	Electric	TRUE	TRUE
CAD002339649	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	3	4	0	0		TRUE	NA				because my air conditioner would be running but not blowing out anything.	TRUE	Central air conditioner	[DO NOT READ] DON'T KNOWElectric	Electric	TRUE	TRUE
CAD002779787	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	Yes	TRUE	3	Don't know	0	0		FALSE	NA				no longer needed it	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD002779787	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	Yes	TRUE	2	Don't know	0	0		FALSE	NA				usefull	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD002551087	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	1	1	0	0		FALSE	NA				NO SENSE TO PAY FOR ENERGY WHEN NOBODY AT HOME TO USE IT.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD002551087	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	3	2	0	0		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002419453	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	Refused	Refused	0	0		FALSE	NA				To maintain it through the hot season.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002419453	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	3	4	0	0		TRUE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002419453	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	Refused	Refused	0	0		FALSE	NA				Save money.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD002281843	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	4	2	0	0		TRUE	NA				So I could reduce my bill	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	TRUE

Measure Information					Criterion A: Familiarity with at least one Ameren Missouri program, rebate, or discount			Criterion B: At least one element of Ameren's program marketing and outreach motivated them to adopt the measure						Criterion C: They had a valid reason for considering the adopted measure energy efficient		Criterion D: For a like measure, they had not received a rebate from Ameren, and had not already tried to receive a rebate from Ameren, and they stated a valid reason for not applying for an Ameren rebate		Criterion E: They had a valid reason for deciding to install the measure		Criterion F: The adopted measure generated electric savings, not gas savings				Meeting all criteria
ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD002750636	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	2	3	0	0		FALSE	NA				the ac broke	TRUE	Central air conditioner	Gas furnace/boiler	[DO NOT READ] DON'T KNOW	TRUE	FALSE
CAD002439061	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	No	TRUE	Don't know	Don't know	0	Don't know		FALSE	NA				He checks in the summer time	TRUE	None	None	Electric	TRUE	FALSE
CAD002439061	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	Don't know	Refused	0	3		FALSE	NA				No need to run it at night	TRUE	None	None	Electric	TRUE	FALSE
CAD002723284	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	4	1	0	0		TRUE	NA				So it works more efficiently.	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002276715	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	[DO NOT READ] DON'T KNOW	Yes	TRUE	3	4	0	0		TRUE	NA				Just too save more energy because we usually keep it at 60-63 during winter and 70-75 during the summer.	TRUE	Central air conditioner	Electric furnace	Gas	TRUE	TRUE
CAD002175073	G224	Efficient freezer	Non-like	Phone	Yes	No	TRUE	4	4	0	0		TRUE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002762688	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	2	2	0	0		FALSE	NA				[DO NOT READ] DON'T KNOW		Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD002547137	G228	Efficient water heater (other than heat pump water heater)	Non-like	Phone	No	Yes	TRUE	1	1	0	0		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD000091720	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	3	2	0	2		FALSE	NA				just good practice, just operating efficiency	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002778413	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	No	TRUE	3	3	0	0		FALSE	NA				make sure it had plenty of freon in it , cleaned and serviced	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD002778413	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	3	3	0	0		FALSE	NA				they just checked it while at my home , I didn't request it	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD000166644	G225	Efficient clothes washer	Non-like	Phone	Yes	Yes	TRUE	3	3	0	0		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Ground-source or geothermal heat pump	Electric	TRUE	FALSE

Measure Information					Criterion A: Familiarity with at least one Ameren Missouri program, rebate, or discount			Criterion B: At least one element of Ameren's program marketing and outreach motivated them to adopt the measure						Criterion C: They had a valid reason for considering the adopted measure energy efficient		Criterion D: For a like measure, they had not received a rebate from Ameren, and had not already tried to receive a rebate from Ameren, and they stated a valid reason for not applying for an Ameren rebate		Criterion E: They had a valid reason for deciding to install the measure		Criterion F: The adopted measure generated electric savings, not gas savings				Meeting all criteria
ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD002193741	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	No	TRUE	4	4	0	1		TRUE	NA				cause the refridgerator went bad	FALSE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD002344338	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	3	1	0	1		FALSE	NA				I have someone come each spring	TRUE	[DO NOT READ] DON'T KNOW	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002289348	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	4	4	0	0		TRUE	NA				we were gonna be gone for a coupkleof days	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	TRUE
CAD002688692	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	Yes	TRUE	Don't know	3	0	0		FALSE	NA				help save money	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD000490371	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	[DO NOT READ] DON'T KNOW	Yes	TRUE	3	3	0	0		FALSE	NA				we live in saint Louis and the weather fluctuates a lot and we don't need to use it	TRUE	Central air conditioner	[DO NOT READ] DON'T KNOWGas	Gas	TRUE	FALSE
CAD000490371	G229	Efficient Windows	Non-like	Phone	[DO NOT READ] DON'T KNOW	Yes	TRUE	4	4	0	0		TRUE	The retailer/dealer/contractor told me it was	TRUE			NA		Central air conditioner	[DO NOT READ] DON'T KNOWGas	Gas	TRUE	TRUE
CAD000490371	G302	Scheduled an air conditioner tune-up	Non-like	Phone	[DO NOT READ] DON'T KNOW	Yes	TRUE	4	4	0	0		TRUE	NA				just do it every year	TRUE	Central air conditioner	[DO NOT READ] DON'T KNOWGas	Gas	TRUE	TRUE
CAD002443279	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	Don't know	2	0	4		TRUE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Electric furnace	Electric	TRUE	TRUE
CAD002443279	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	2	1	0	3		FALSE	NA				Because we needed a new air conditioner so we bought a new one.	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD003392328	G226	Efficient dishwasher (exclude from NPSO because virtually all dishwashers on the market are ENERGYSTAR)	Non-like	Phone	No	Yes	TRUE	1	4	0	0		TRUE	It's ENERGY STAR-certified	TRUE			NA		Air-source heat pump	Gas furnace/boilerAir-source heat pump	Electric	TRUE	FALSE
CAD003392328	G301	Removed a refrigerator or freezer	Non-like	Phone	No	Yes	TRUE	4	4	0	0		TRUE	NA				it was old	TRUE	Air-source heat pump	Gas furnace/boilerAir-source heat pump	Electric	TRUE	TRUE

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ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD003392328	G228	Efficient water heater (other than heat pump water heater)	Non-like	Phone	No	Yes	TRUE	4	4	0	0		TRUE	It's ENERGY STAR-certified	TRUE			NA		Air-source heat pump	Gas furnace/boilerAir-source heat pump	Electric	TRUE	TRUE
CAD000148252	G301	Removed a refrigerator or freezer	Non-like	Phone	No	Yes	TRUE	4	4	0	0		TRUE	NA				[DO NOT READ] DON'T KNOW		Central air conditioner	Electric furnace	Electric	TRUE	TRUE
CAD002577182	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	No	TRUE	1	1	0	3		FALSE	NA				to get the coil cleaned, there's always a lot of dirt that gets in there	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000413427	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	3	1	0	1		FALSE	NA				to make it morwe eefficient	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD000413427	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	2	1	0	Refused		FALSE	what itr sauid	TRUE			NA		Central air conditioner	Electric furnace	Electric	TRUE	FALSE
CAD000413427	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	Refused	4	0	Don't know		TRUE	NA				saves money	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	TRUE
CAD002794146	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	2	1	0	0		FALSE	NA				for when im not home I adjust it to a lower temp	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD002794146	G225	Efficient clothes washer	Non-like	Phone	Yes	No	TRUE	1	1	0	0		FALSE	The retailer/dealer/contractor told me it was	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000381277	G225	Efficient clothes washer	Non-like	Phone	No	Yes	TRUE	4	4	0	4		TRUE	Marked on the sticker.	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002788370	G228	Efficient water heater (other than heat pump water heater)	Non-like	Phone	Yes	Yes	TRUE	4	4	0	0		TRUE	It lowers the bill	TRUE			NA		Window or wall air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002788370	G224	Efficient freezer	Non-like	Phone	Yes	Yes	TRUE	4	3	0	0		TRUE	It lowers the bill	TRUE			NA		Window or wall air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD002557560	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	No	TRUE	4	4	0	4		TRUE	NA				just trying not to use as much energy, turn it down when i go to bed and dont let it go past 60	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002277386	G229	Efficient Windows	Non-like	Phone	Yes	No	TRUE	3	3	0	0		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE

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ID	Measure ID	Measure	Like or Non-like	Web or Phone Survey	C2. Have you seen or heard of the Ameren Missouri energy efficiency programs?	C10. Are you aware that Ameren Missouri offers rebates and discounts for energy-saving equipment in your home?	Criterion A met? (Yes to C2 or C10)	QG12_A. Information about energy savings from Ameren's marketing, or bill-insert	QG12_C. Information from colleagues or friends who installed energy efficient equipment and received a rebate from Ameren	QG12_D. Past participation in an Ameren rebate program	QG12_E. Information from the energy assessment conducted at your home through Ameren	Criterion B met for 50% savings? (Max rating was 3)	Criterion B met for 100% savings? (Max rating was 4)	QG4. How do you know the measure is energy efficient?	Criterion C met? (qualitative assessment)	QG9. Why you didn't apply for rebate?	Criterion D met? (qualitative assessment)	QG6/QG7. Why did you adopt this measure?	Criterion E met? (qualitative assessment)	Cooling System	Heating System	Water Heating Fuel	Criterion F met? (depends on the measure)	Meeting all criteria
CAD002531208	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	3	1	0	1		FALSE	NA				well its saves money in the long run and if theres problems they find them.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002531208	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	Yes	TRUE	3	Don't know	0	2		FALSE	NA				to save money	TRUE	Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD000233264	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	Don't know	3	0	3		FALSE	NA				Because my wife likes it colder at night.	TRUE	Central air conditioner	Gas furnace/boiler	[DO NOT READ] DON'T KNOW	FALSE	FALSE
CAD002674741	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	No	TRUE	3	1	0	1		FALSE	NA				I have gotten a new one	TRUE	Central air conditioner	[DO NOT READ] DON'T KNOWElectric	Electric	TRUE	FALSE
CAD000304876	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	Yes	TRUE	3	3	0	2		FALSE	NA				Because we needed a new fridge, and when I chose it, I needed it to be energy efficient.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000304876	G225	Efficient clothes washer	Non-like	Phone	Yes	Yes	TRUE	3	3	0	2		FALSE	It has a sign that says high effiecny, it was highly detailed.	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000304876	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	3	2	0	2		FALSE	NA				It was for the air quality.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000047136	G224	Efficient freezer	Non-like	Phone	Yes	Yes	TRUE	4	4	0	4		TRUE	The retailer/dealer/contractor told me it was	TRUE			NA		Central air conditioner	Ductless or mini-split heat pump	Electric	TRUE	TRUE
CAD000315574	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	3	3	0	3		FALSE	NA				It was part of the purchase agreement, that they service it once every year	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000315574	G228	Efficient water heater (other than heat pump water heater)	Non-like	Phone	No	Yes	TRUE	3	3	0	2		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE

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CAD000302905	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	No	Yes	TRUE	2	1	0	1		FALSE	NA				there was so sense in havoing it run all day	TRUE	Central air conditioner	Gas furnace/boiler	Electric	FALSE	FALSE
CAD000302905	G302	Scheduled an air conditioner tune-up	Non-like	Phone	No	Yes	TRUE	3	1	0	4		TRUE	NA				casue I have a regusular tune up every summer for the heat. time track	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE
CAD000302905	G304	Other action	Non-like	Phone	No	Yes	TRUE	1	1	0	1		FALSE	NA				it was vented properly and the whole thing blew it. destroyed it.	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	FALSE
CAD002203571	G225	Efficient clothes washer	Non-like	Phone	Yes	Yes	TRUE	2	3	0	2		FALSE	Word of mouth	TRUE			NA		None	Electric furnace	Electric	TRUE	FALSE
CAD000243723	G225	Efficient clothes washer	Non-like	Phone	Yes	Yes	TRUE	3	2	0	0		FALSE	I read the information	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000243723	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	Don't know	Don't know	0	0		FALSE	NA				Because you should do that every season, its better for the air conditioner to catch things in the beginning rather than it go haywire in the middle of the season.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000432783	G230	Additional insulation	Non-like	Phone	No	Yes	TRUE	1	Don't know	0	0		FALSE	NA				NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000369716	G228	Efficient water heater (other than heat pump water heater)	Non-like	Phone	Yes	Yes	TRUE	3	2	0	0		FALSE	It's ENERGY STAR-certified	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	FALSE	FALSE
CAD000369716	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	Yes	TRUE	2	2	0	0		FALSE	NA				it was burning up.	FALSE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002337612	G229	Efficient Windows	Non-like	Phone	[DO NOT READ] DON'T KNOW	Yes	TRUE	3	2	1	0		FALSE	The retailer/dealer/contractor told me it was	TRUE			NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE

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CAD002622738	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	Yes	TRUE	4	4	0	0		TRUE	NA				Well we don't need it hot in the house and night and when we are not at home it doesn't need to run at all.	TRUE	[DO NOT READ] DON'T KNOW	[DO NOT READ] DON'T KNOWElectric	Electric	TRUE	TRUE
CAD002419821	G303	Programmed thermostat to reduce usage (either at night or during the day when people are not home)	Non-like	Phone	Yes	Yes	TRUE	Refused	4	0	0		TRUE	NA				Its just a matter of economy I have always done it.	TRUE	Window or wall air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002646472	G302	Scheduled an air conditioner tune-up	Non-like	Phone	Yes	Yes	TRUE	3	Refused	0	0		FALSE	NA				just part of an agreement we have with the air conditioner people	TRUE	Central air conditioner	Electric furnace	Gas	TRUE	FALSE
CAD002646472	G301	Removed a refrigerator or freezer	Non-like	Phone	Yes	Yes	TRUE	Refused	Refused	0	0		FALSE	NA				It was broken	FALSE	Central air conditioner	Electric furnace	Gas	TRUE	FALSE
CAD002565360	G230	Additional insulation	Non-like	Phone	No	Yes	TRUE	1	4	1	0		TRUE	NA				NA		Central air conditioner	Electric baseboard heat	Electric	TRUE	TRUE
CAD002277386	G230	Additional insulation	Non-like	Phone	Yes	No	TRUE	2	3	0	0		FALSE	NA				NA		Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD000047136	G230	Additional insulation	Non-like	Phone	Yes	Yes	TRUE	4	4	0	4		TRUE	NA				NA		Central air conditioner	Ductless or mini-split heat pump	Electric	TRUE	TRUE
CAD002698885	G210	Insulation	Non-like	Phone	Yes	Yes	TRUE	3	3	0	0		FALSE	The retailer/dealer/contractor told me it was	TRUE			to replace the old stuff	TRUE	Window or wall air conditioner	Gas furnace/boiler	Electric	TRUE	FALSE
CAD002565360	G210	Insulation	Non-like	Phone	No	Yes	TRUE	1	4	1	0		TRUE	because the more insulation you have the warmer it is, otherwise its going out the walls	TRUE			[DO NOT READ] DON'T KNOW		Central air conditioner	Electric baseboard heat	Electric	TRUE	TRUE
CAD000381277	G221	Programmable (but not "smart") thermostat	Non-like	Phone	No	Yes	TRUE	4	4	0	4		TRUE	NA				[DO NOT READ] DON'T KNOW		Central air conditioner	Gas furnace/boiler	Gas	TRUE	TRUE
CAD002413700	G221	Programmable (but not "smart") thermostat	Non-like	Phone	No	Yes	TRUE	3	3	3	1		FALSE	NA				Its the one that came with the home and the cost.	TRUE	Central air conditioner	Gas furnace/boiler	Gas	TRUE	FALSE
CAD002175073	G202	Efficient refrigerator	Non-like	Phone	Yes	No	TRUE	3	4	0	0		TRUE	The retailer/dealer/contractor told me it was	TRUE			IT WAS THE ONE I LIKED	TRUE	Central air conditioner	Gas furnace/boiler	Electric	TRUE	TRUE

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CAD002193741	G202	Efficient refrigerator	Non-like	Phone	Yes	No	TRUE	4	3	0	Don't know		TRUE	It's ENERGY STAR-certified	TRUE			Just cause we needed one	TRUE	Central air conditioner	Electric furnace	Electric	TRUE	TRUE