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Impact and Process Evaluation of the 2014 (PY7) Ameren Illinois Company School Kits Program

Final

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1. Executive Summary

This report summarizes the results of the Residential Energy Efficiency School Kits (School Kits) Program for Program Year 7 (PY7). The School Kits Program was included as part of AIC's ActOnEnergy portfolio of energy efficiency programs beginning in PY7. Through this program in PY7, AIC distributes kits containing energy efficient items during on-site presentations to fifth through eighth grade students. The program goal is to increase sales and awareness of ENERGY STAR-qualified lighting products along with other AIC energy efficiency offerings that reduce energy consumption. The School Kits Program provided energy efficiency kits to 7,647 students in PY7 (June 1, 2014–May 31, 2015).

The kits contained CFLs, faucet aerators and showerheads along with instruction materials about how to properly set water heater temperature (Table 1). The School Kits Program materials also asked participants to complete an online survey to verify installation of energy-efficient items.

Table 1. PY7 School Kits Products

Product	Quantity per Kit
EcoSave 13-watt CFL	2
1.0 GPM Bath Faucet Aerator	1
2.0 GPM Dual Kitchen Faucet Aerator	1
1.75 GPM Chrome High Efficiency Showerhead	1
Hot Water Temperature Card Thermometer	1
Instructional Materials	N/A

AIC implementation plans assumed electricity savings of 245 annual net kWh per kit.¹ The plan specified program objectives that included:

- Increased awareness of AIC's energy efficiency offerings,
- Increased knowledge of energy issues, and
- Increased energy efficiency for targeted students and their families.

Program Impacts

Table 2 summarizes the net electricity and demand savings from the PY7 School Kits Program, which includes 532 MWh, 0.078 MW and 63,726 therms. To determine gross savings and net realization rates, the evaluation team applied the Illinois Statewide TRM Version 3 (IL-TRM V3.0) deemed per-unit gross savings values for program measures and the Stakeholder Advisory Group's (SAG's) approved net-to-gross ratio (NTGR) for this program.

¹ Ameren Illinois Company. Program Year Seven Implementation Plan, November 14, 2014. Appendix D- PY7 Measures, Page 120.

Table 2. PY7 Net School Kits Program Impacts

	Ex-Ante Gross	Realization Rate*	Ex-Post Gross	NTGR	Ex-Post Net
Energy Savings (MWh)					
Total MWh	653	90%	591	0.90	532
Demand Savings (MW)					
Total MW	0.082	103%	0.085	0.93	0.078
Energy Savings (therms)					
Total therms	86,910	76%	65,619	0.97	63,726

*Realization rates different from 1.0 are due to differences between the ex-ante and ex-post per unit savings.

Process Results

Through the evaluation team's process review, utility and implementation staff expressed high satisfaction with how the program performed in PY7. Implementers indicate that the program has been successful and they have no plans to make program changes for PY8. Further, the program team was able to meet the kit-distribution goals on time and within budget. Implementers report that operations are running smoothly with no significant issues.

Key Findings and Recommendations

The PY7 School Kits Program delivered 7,647 kits to students. In its second year, the program continued to establish relationships with schools to secure future participation and improve marketing methods to increase participation from additional schools. Although the utility and implementation staff are satisfied with the program, the evaluation team has identified the following recommendations for future program years.

- **Conclusion #1:** The participant survey response rate dropped from 55% in PY6 to 23% in PY7. While we found no obvious reason for this change, student response rates typically depend on the amount of teacher encouragement or requirement for completion. Teachers may perceive that chances of having the "highest" participation and winning the \$250 gift card are slim. Furthermore, the evaluation team is concerned that the survey data may not be representative of the entire program population due to the low response rate.
- **Recommendation:** AIC and the program implementers may want to consider offering every teacher an incentive or eligibility for a drawing based on a threshold proportion of surveys received. Another option is to add an incentive to the students and families such as a chance to win a gift card or a token gift in exchange for completing the survey.
- **Conclusion #2:** The evaluation team used results from the implementer's participant surveys as input to the program savings calculations. In the PY6 evaluation, we recommended modifications to the tracking system. These changes were not made for PY7 since the evaluation was completed mid-year. As such, we provide these same recommendations below:
- **Recommendation:** Consider having the survey reviewed by a third-party evaluator to ensure that the participant survey responses provide the data needed to best estimate program savings. Alternatively, consider making the following modifications to the online survey instrument:

Executive Summary

- Capture installation rate for each CFL wattage if more than one wattage of bulb is included in the kit in future program years²
- Determine if participants adjusted water heater temperatures up or down
- Determine fuel saturation for all participants
- Collect number of people per household
- Determine single-family or multifamily residence
- Determine number of bathroom faucets and showerheads per household
- Remove inconsistencies that occurred and were reported in PY6 and occurred again in PY7. For example, School Kits survey data indicating CFL installations included these responses: “Yes,” “No,” “0,” “1,” and “2.”

² The PY7 kit included only 13-watt CFLs.

2. Evaluation Approach

The PY7 evaluation of the School Kits Program involved in-depth interviews with program management and staff, a review of program materials, and impact estimates using participant survey data and the IL-TRM V3.0.

2.1 Research Objectives

The PY7 School Kits impact evaluation sought to provide estimates of the program's gross and net electricity savings. Specifically, we researched the following questions:

- How many kits did the program distribute?
- What installation rate did each measure achieve?
- What were the estimated gross energy and demand impacts from this program?
- What were the estimated net energy and demand impacts from this program?

A limited process evaluation explored how the program performed in its second year and answered the following process-related questions:

- What, if any, implementation challenges occurred in PY7?
- Did the program operate effectively?
- How was the program marketed?
- What participation challenges existed for school-based customers?
- What program changes could improve program effectiveness?

2.2 Evaluation Tasks

Table 3 summarizes the tasks the evaluation team conducted for the PY7 evaluation of the School Kits Program.

Table 3. Summary of Evaluation Activities for PY7

Activity	PY7 Impact	PY7 Process	Forward Looking	Details
Program Staff In-Depth Interviews		✓	✓	Interviewed five program and implementation staff to gain insights into the program's design and delivery
Review of Program Materials and Data		✓		Reviewed implementation plan, program marketing materials, and instructional materials
Database Analysis	✓	✓		Summarized database information to determine participation, key program statistics, and savings
Review of Participant Surveys	✓			Reviewed participant survey data to assess installation rates

We summarize each of these activities below.

2.2.1 Program Staff In-Depth Interviews

The evaluation team conducted five interviews with AIC and implementation staff who were responsible for managing, marketing, and delivering the program. We interviewed program staff as described in Table 4 to assess program design, implementation, communications, and strengths and weaknesses.

Table 4. Program Staff Interviews

Company	Number of Staff Interviewed
CLEAResult	2
Ameren	1
Leidos	1
EFI	1

2.2.2 Review of Program Materials and Data

The evaluation team reviewed the following program data:

- Program database
- Implementer's web-based survey questions and results
- Program collateral
- Implementation plans

2.2.3 Database Analysis and Review of Participant Surveys

The evaluation team reviewed the program-tracking database to determine participation levels, and reviewed the results of an online survey administered by the program for key program statistics.

2.2.4 Impact Analysis

The evaluation team used the program-tracking database to confirm the number of reported kits distributed and to apply the IL-TRM V3.0 deemed per-unit gross electric savings values for program measures, as shown in Table 5. The deemed net-to-gross ratio (NTGR) and deemed net per unit savings values are also reported in Table 5.

To estimate the program's electric energy savings, the evaluation team applied the 16%³ deemed electric water heater saturation to the verified school kit installations (derived from the implementer survey), as water heater heating fuel type was not available in the tracking data or implementer survey.

³ Deemed value indicated in the IL-TRM V3.0.

Table 5. PY7 School Kits Electric Savings — Per Unit*

Measure	Gross kWh	Gross kW	NTGR	Net kWh	Net kW
EcoSave 13-watt CFL	29.7	0.003	0.85	25.2	0.003
1.0 GPM Bath Faucet Aerator	18.6	0.025	1.00	18.6	0.025
2.0 GPM Dual Kitchen Faucet Aerator	130.7	0.032	1.00	130.7	0.032
1.75 GPM Chrome High Efficiency Showerhead	285.0	0.031	0.94	267.9	0.029
Hot Water Temperature Card Thermometer	86.4	0.010	1.0	86.4	0.010

*Totals may not sum due to rounding.

The evaluation team applied the 84% deemed gas water heating saturation to the School Kits verified installations (derived from the implementer survey) to estimate the program's gas energy savings. The evaluation team used the IL-TRM V3.0 deemed per-unit gross gas savings values for program measures, as shown in Table 6. The deemed net-to-gross ratio (NTGR) and deemed net savings values are also reported in Table 6.

Table 6. PY7 School Kits Gas Savings — Per Unit*

Measure	Gross Therms	NTGR	Net Therms
1.0 GPM Bath Faucet Aerator	0.8	1.00	0.8
2.0 GPM Dual Kitchen Faucet Aerator	5.9	1.00	5.9
1.75 GPM Chrome High Efficiency Showerhead	12.8	0.95	12.1
Hot Water Temperature Card Thermometer	6.4	1.00	6.4

*Totals may not sum due to rounding.

Verification of Report Distribution

CLEAResult and Leidos maintain a program database for School Kits Program participants. The School Kits database includes the following information:

- School name and address
- Principal's name
- Project ID
- Incentive amounts
- Presentation date
- Number of kits shipped

The evaluation team verified participation by reviewing the project IDs, contact information, kit counts, and established that presentation dates fell within the PY7 program period. The evaluation team also verified the School Kits Program records and determined kit installation rates through the implementer's student survey data.

Installation Rates

The evaluation used results from the implementer survey to estimate installation rates for kit items except for the CFL measure, which utilizes the prescribed value in IL-TRM V3.0. The implementer asked every participant to respond to a web-based survey. In total, 1,789 School Kits Program participants completed a survey out of the 7,647 kits distributed in PY7 (a response rate of 23%).

NTG Ratio

The evaluation team applied the Stakeholder Advisory Group (SAG) approved deemed NTG values (Table 7) for program measures.

Table 7. PY7 School Kits NTG Estimates - Deemed

Measure	Electric NTGR			Natural Gas NTGR		
	Free-Ridership	Participant Spillover	NTGR	Free-Ridership	Participant Spillover	NTGR
CFLs	22%	7.10%	0.85	N/A	N/A	N/A
Showerheads	13%	7.10%	0.94	13%	7.60%	0.95
Faucet Aerators	7%	7.10%	1.00	6.70%	7.60%	1.00
Water Heater Setback	0%	N/A	1.00	0%	7.60%	1.00

2.3 Sources and Mitigation of Error

Table 8 summarizes possible error sources associated with data collection conducted for School Kits. We discuss each item in detail below.

Table 8. Possible Sources of Error

Analytical Task	Survey Error		Non-Survey Error
	Sampling Error	Non-Sampling Survey Error	
Participant Surveys ^a	N/A – Census attempt	N/A	N/A
Gross Impact Calculations	N/A	N/A	Data processing error
Net Impact Calculations	N/A	N/A	Data processing error

^a Survey designed and data collected by the implementer, not the evaluator.

The evaluation team took a number of steps to mitigate potential error sources throughout the planning and implementation of the PY7 School Kits Program evaluation:

Survey Error

- **Web-Based Participant Surveys:** In fielding surveys to school-based participants, the implementer attempted a census and therefore there is no sampling error.

Non-Survey Error

- **Web-Based Participant Surveys:** The survey response rate was 23%, which does not preclude non-response bias. However, since the implementer conducted the surveys, we do not have information about how they attempted to mitigate against this potential bias or its extent.
- **Data Processing Errors**
 - **Gross Impact Calculations:** The evaluation team applied deemed savings values to participant data in the tracking database to calculate gross impacts. To minimize data processing errors, the evaluation team had different team members review all calculations, verifying accurate performance of calculations.
 - **Net Impact Calculations:** The evaluation team applied the deemed NTGRs (shown in Table 5) to estimate the program's net impacts. To minimize data processing errors, the evaluation team had different team members review all calculations, verifying accurate performance of calculations.

3. Detailed Evaluation Findings

3.1 Program Description

The School Kits Program provides in-class presentations to fifth- to eighth-grade students. EFI sends the kits to the schools and CLEAResult distributes them at the start of each presentation for students to take home to their families.

The program design sought to provide a positive experience for the school administrators and teachers by offering a program that was easy to schedule and receive. In addition, the program strived to make the program and its presentation informative yet enjoyable for the students. In addition, the program sought to increase awareness of other AIC programs through the presentation and the materials in the kit. The program used the outreach efforts described in Section 4.2.2 to recruit schools.

The School Kits Program provided education and materials to 7,647 students from 37 different schools in PY7. The number of kits distributed to each school ranged from 11 to 815.

3.2 Summary of Program Operations

AIC used Leidos, CLEAResult, and the EFI to deliver the program and achieve the program's energy-savings goals. Leidos manages the program's implementation team and provides reporting to AIC on program activities. CLEAResult developed the curriculum, recruits schools and schedules the school presentations, notifies EFI of the schedule and the number of kits needed at the schools in time for the presentation, and presents the program to fifth- to eighth-grade classrooms in the schools. EFI mails the AIC-branded kits and marketing materials directly to the schools about two weeks before the scheduled performance.

3.3 Program Goals

In addition to the energy savings achieved through the kit and discussed in the Impact Assessment section of this report, another goal is to have the students take home the lessons they learned from the presentation so that they can educate their families. The activity worksheet in the kit engages the parents and informs them of additional energy efficiency program opportunities available through AIC.

The original goals stated by the program and implementation staff during the interviews were to distribute at least 5,000 kits. AIC later increased this goal to 7,500 kits. In total, the program distributed 7,647 kits in PY7. Interviewees reported that they achieved the higher goal without exceeding the program budget.

3.4 Marketing and Outreach

The School Kits Program used direct mail outreach and conference presentations to market the program and recruit schools. Implementation staff reported that school staff also promoted the program to other schools through word-of-mouth.

Marketing at teacher- and school-focused conferences raised a lot of interest in the program. According to CLEAResult, reading conferences have been particularly successful in recruiting participating schools, more

Detailed Evaluation Findings

so than the enrollment garnered from science conferences. Implementers also market the program at environmental conferences and to Boy Scout and Girl Scout troop conferences.

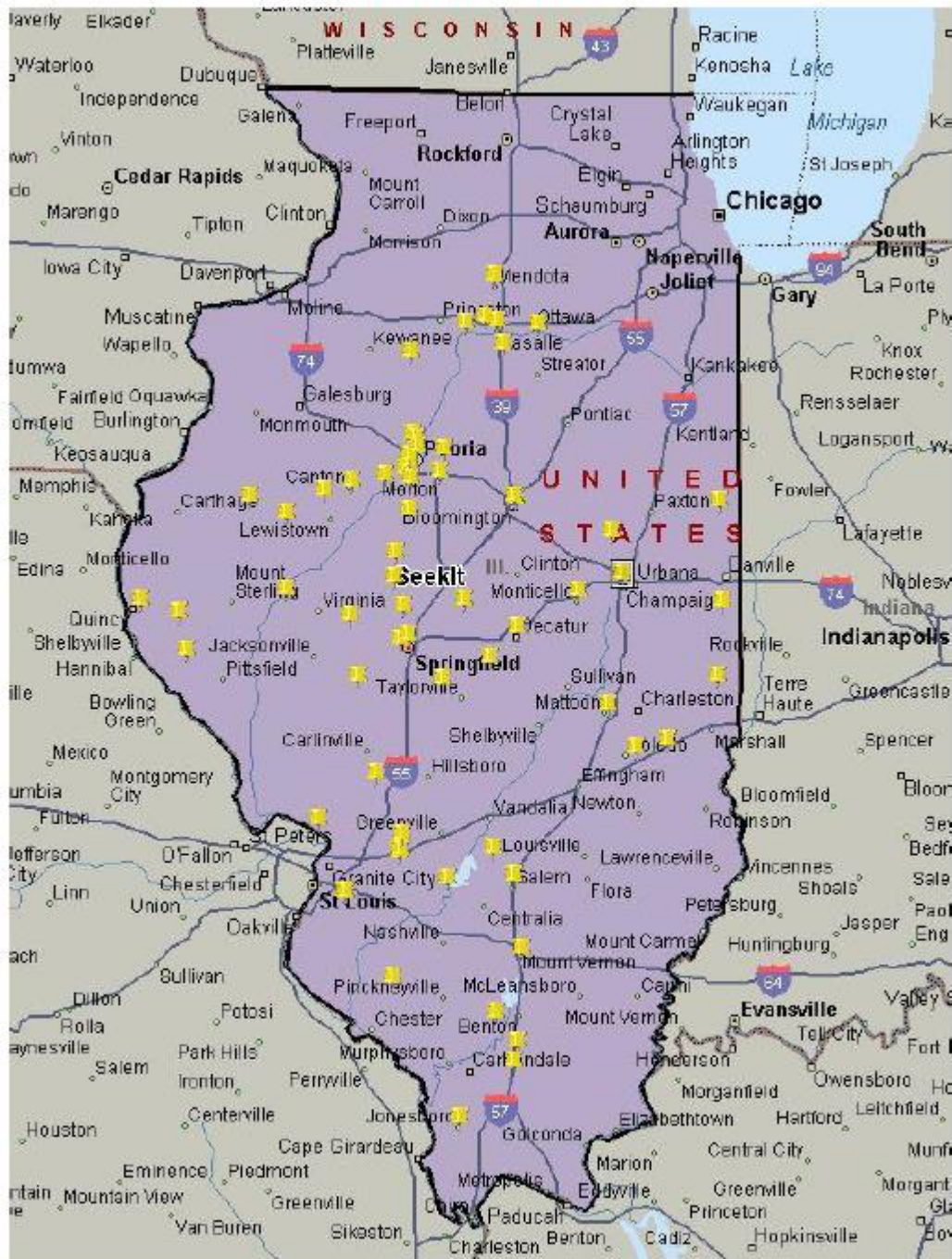
Although marketing at conferences is effective, direct mail is the primary marketing approach used by program staff. In particular, CLEAResult sends mass mailings to schools a few times a year, focusing the marketing campaign first with middle and junior high schools, then to elementary schools.

The primary challenge with marketing the program is the large size of AIC's service territory and the rural areas within the territory. In rural areas, the program implementer considers how many of the children attending the school likely live in AIC's service territory. Since many AIC rural service areas are near other cooperative utilities, all school attendees may not be AIC customers. Implementers use school zip codes to assess the likelihood that students are mostly AIC customers. Since the implementer survey does not collect home utility information, we assume all installations occur in AIC territory.

The School Kits Program was implemented at school locations shown in Figure 1⁴.

⁴ Source: CLEAResult's report to Leidos dated June 2015. File name: "Student Energy Education Kit CLEAResult 2014-2015.pdf".

Figure 1. Kit Distribution in PY7



3.5 The Program Presentation

The presenter, an employee of CLEAResult, arrives at the school at least 40 minutes before the presentation is scheduled to begin to set up, meet with the principal, and gather the kits previously shipped to the school by EFI. They present in one to seven classrooms at that school in a day, but typically conducts three or four presentations. The presentation follows a PowerPoint slide deck, but also includes items that the children can see and touch, such as a lighted panel showing meter readings of various bulb types' energy use.

The presentation starts with the “big picture,” which is the Earth lights picture from NASA,⁵ as shown in Figure 2 to emphasize the magnitude of energy consumption across the world. The presentation describes why conservation is important and points out that much of the energy produced is from non-renewable, limited, and polluting sources. The presenter encourages students to learn more about energy efficiency and take action in their homes, starting with the provided energy efficiency kit.

Figure 2. Earth Lights



According to the implementer, the presenters have received only positive feedback from teachers and school staff, and is well received by the students. CLEAResult staff indicated that the younger grades (fifth through seventh) are more receptive than eighth graders to the message.

3.6 School and Customer Participation

Implementation staff reported satisfaction with the PY7 participation levels and expressed confidence in the future growth of the School Kits Program. The program implementers reported visiting 37 schools in PY7 out of the approximately 900 schools in AIC's service territory. In addition, CLEAResult can offer this program to

⁵ http://eoimages.gsfc.nasa.gov/images/imagerecords/55000/55167/earth_lights.jpg

the targeted grades for many years as each new group of students enters fifth grade (or other grade, as determined by the school).

The teachers encourage the students to complete the participant survey after they take their kits home. The two teachers, out of all participating classrooms, providing the highest survey response rates received a \$250 gift card for their efforts.

3.7 Administration of the Participant Surveys

The evaluation team analyzed data from implementer-designed student surveys to assess installation rates. The evaluation team applied the installation rates to program participation totals to estimate program savings for PY7. It is important to note that in total, 1,789 of the reported 7,647 participants in the school-based program returned surveys (23%).

The evaluation team noted that some inconsistencies reported in PY6, including variability in participant responses, occurred again in PY7. For example, School Kits survey data indicating CFL installations had these responses: “Yes,” “No,” “0,” “1,” and “2.” In PY6, a comparison of the data addressing installation rates revealed two different versions of the survey question. The web-based survey asked: “How many CFLs did you install from your kit?” While all surveys responses were submitted online, the question was also asked as: “Installed 2 CFLs in kit?” In this case, the evaluation team assumed a “Yes” response indicated the participant had installed two CFLs and that a “No” response indicated the participant installed zero or one CFL. The evaluation team also assumed the proportion of customers installing zero or one CFL would be the same as the proportion of customers answering “0” or “1” when asked how many CFLs they had installed from their kit. The same assumptions were used for this evaluation of the PY7 School Kits Program.

Another issue with the survey’s design is that the school kit survey did not ask participants to verify their space or water heating fuel types as recommended in the PY6 evaluation report. This information would increase the confidence and precision of the energy savings estimates for the program.

The response rate for the PY7 participant surveys dropped to 23% from the PY6 response rate of 55%, despite no evidence of changes to the survey availability or offered incentives. While we found no obvious reason for this change, student response rates typically depend on the amount of teacher encouragement or requirement for completion. Teachers may perceive that chances of having the “highest” participation and winning the \$250 gift card are slim.

3.8 Communications and Cooperation

The implementation team has a number of processes in place to ensure ongoing and effective communication. First, CLEAResult implementation staff holds two monthly meetings with program partners (Leidos, EFI, and sometimes AIC) to review issues, goals, progress, and upcoming events. AIC also meets with CLEAResult every week to discuss program details. Leidos provides AIC with monthly reports of program activity concerning kit delivery and budget goals.

EFI and CLEAResult also have communication protocols and program checks in place to ensure they deliver the correct number of kits to the schools on time. In particular, the presenter brings along a few extra kits to the school, just in case the number of students changed since the presentation was scheduled. This approach appears to be sufficient as there were no reports of insufficient kits by the program staff and implementers in PY7.

Finally, CLEAResult management meets with their presenter regularly to ensure a smooth and efficient travel schedule. All interviewees reported that these scheduled meetings are working well in updating everyone on activities and promptly resolving any issues

3.9 Data Quality and Tracking

The implementer reported that, overall, data tracking for the School Kits Program worked very well. The only reported challenge is making sure that there is no duplication of kits delivered to the same homes, but the only way to avoid this is by only offering the program to a specific grade level by school each year. According to one interviewee, energy efficiency kits may also be offered by third-party implementers that want to introduce their programs in Illinois, and that raises the risk of overlap with the School Kits Program participants. The program staff and implementers would like to avoid this but recognize the difficulty of obtaining information about other such energy efficiency offerings.

3.10 Program Strengths and Success

The School Kits Program staff interviews revealed unique program strengths and successes.

- **Participation:** The implementer reported teachers were excited about the program and the fact that they could use the materials as a starting point for future discussions about energy topics. Additionally, implementation staff reported that working with fifth- to eighth-grade classes gave schools experience and familiarity with the program, which encouraged repeat participation from PY6 to PY7, and to future years with new students entering the targeted grades. The program records indicate that 17 out of the 33 schools visited in PY6 (52%) were again visited in PY7 so the program could be offered to new students entering into the targeted grades.
- **The Kit:** The kit items are contained in a box that resembles a Chinese food take-out container. The packaging is well-received by the students who are enthusiastic about the kit and its contents. Implementation staff said this program is the only one in the Midwest to use the take-out container and that this container does not increase per-kit costs.
- **Working within Budget:** The implementers report that the budget is sufficient. Although budgets typically must balance quality and quantity, this program has been successful within the allotted budget.
- **Overall Delivery:** CLEAResult reports that this is the best program it has ever worked with. According to all interviewed program staff, this program is operating smoothly and successfully delivers the targeted number of kits within budget. According to program managers and staff, the PY6 program also ran smoothly and there were only minor wording changes to the program's marketing materials in PY7. AIC and the implementation staff have no plans for PY8 program changes.

3.11 Impact Assessment

3.11.1 Gross Impacts

The evaluation used results from the participant survey to estimate installation rates for kit items except for the CFL measures, which used the prescribed value in V3.0. Table 9 lists the verified installation rates for each

kit measure that were used in the electric and gas ex-post savings calculations. The ex-ante savings calculations produced by the implementer used installation rates derived from multiples sources including the V3.0, Illinois Statewide TRM V1, and internal estimates.

Table 9. PY7 School Kits Installation Rates

Measure	Installation Rate
EcoSave 13-watt CFL	72.2%
1.0 GPM Bath Faucet Aerator	41%
2.0 GPM Dual Kitchen Faucet Aerator	43%
1.75 GPM Chrome High-Efficiency Showerhead	46%
Hot Water Temperature Card Thermometer	23%

Based on reported program participation and evaluated savings values, the program achieved total gross electric savings of 591 MWh and demand savings of 0.085 MW. Table 10 shows ex-ante and ex-post gross electric and demand impacts. The difference between reported measures and verified measures is due to the application of installation rates developed from the implementer's web-based survey for students.⁶

⁶ The evaluation team used the IL-TRM V3.0 prescribed installation rate of 72.2% for energy efficiency kits for the EcoSave 13- Watt CFL measure.

Table 10. PY7 Program Ex-Ante and Ex-Post Gross Electric Impacts*

Measure	Ex-Ante Gross Impacts		Reported Measures ^a	Evaluated Installation Rate ^b	Verified Measures ^c	Ex-Post Gross Impacts		Gross Realization Rate ^d	
	MWh	MW				MWh	MW	MWh	MW
EcoSave 13-watt CFL	306	0.033	15,294	72%	11,042	328	0.035	107%	106%
1.0 GPM Bath Faucet Aerator	26	0.013	1,224	41%	503	9	0.013	36%	99%
2.0 GPM Dual Kitchen Faucet Aerator	26	0.013	1,224	43%	522	68	0.017	262%	132%
1.75 GPM Chrome High Efficiency Showerhead	243	0.018	1,224	46%	565	161	0.018	66%	100%
Hot Water Temperature Card Thermometer	53	0.006	1,224	23%	283	24	0.003	46%	46%
Total	653	0.082	20,188	64%	12,916	591	0.085	90%	103%

* Totals may not sum due to rounding.

^a Based on IL-TRM V3.0, we assumed 16% of total verified water saving measures were installed in homes with electric water heating.

^b Reported percentages in table are rounded from their true value.

^c The difference between reported measures and verified measures is due to the application of installation rates developed from the implementer's web-based survey for students.

^d Realization rates different from 1.0 are due to differences between ex-ante and ex-post per unit savings. Gross realization rate = ex-post gross savings ÷ ex-ante gross savings.

The evaluation team received ex-ante electric savings estimates from the School Kits program implementer and reviewed the assumed estimates for comparisons to the ex-post electric savings methodologies. Ex-ante electric savings methodology assumptions and inputs were not made available to the evaluation team to enable a recreation of the claimed ex-ante electric estimates. Because of this, there are unknown differences between the ex-ante and ex-post electric savings assumptions for kit measures. The differences between total ex-ante and ex-post electric savings estimates are due to differences in the ex-ante and ex-post gross electric per unit savings assumptions and installation rates. Described below are the discrepancies for each program measure:

- Ex-ante CFL per unit savings estimate of 27.7 kWh and 0.00295 kW are slightly less than the ex-post per unit savings estimates of 29.7 kWh and 0.00313 kW calculated in accordance with IL-TRM V3.0. A possible difference between the ex-ante and ex-post per unit savings estimates could be that the ex-post per unit savings estimate is using Illinois home type information from the U.S. Energy Information Administration to estimate a single-family and multi-family weighted average waste heat factor value in conjunction with the prescribed single-family and multi-family values in IL-TRM V3.0. Ex-ante and ex-post population savings were both calculated using the IL-TRM V3.0 installation rate of 72.2%.

- Ex-ante bathroom faucet aerator per unit savings estimate of 44.4 kWh is more than the ex-post per unit savings estimate of 18.6 kWh calculated in accordance with the IL-TRM V3.0. The implementer acknowledged they did not calculate separate savings estimates for the different aerator types and that they used 44.4 kWh and 0.022 kW gross per-unit savings estimates for both kitchen faucet aerator and bathroom faucet aerator ex-ante gross savings calculations. Another source of the ex-post gross kWh population savings being less than the ex-ante gross kWh population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The ex-ante savings used an installation rate (ISR) of 48%⁷ based off Illinois Statewide TRM V1 while the evaluation team used the bathroom faucet aerator-specific 41% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings.
- Ex-ante kitchen faucet aerator per unit savings estimates of 44.4 kWh and 0.022 kW are less than the ex-post per unit savings estimate of 131 kWh and 0.032 kW calculated in accordance with the IL-TRM V3.0. The implementer acknowledged they did not calculate separate savings estimates for the different aerator types and that they used 44.4 kWh and 0.022 kW gross per-unit savings estimates for both kitchen faucet aerator and bathroom faucet aerator ex-ante gross savings calculations. Another source of the ex-post gross population savings being more than the ex-ante gross population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The ex-ante savings used an ISR of 48% based off Illinois Statewide TRM V1 while the evaluation team used the kitchen faucet aerator-specific 43% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings.
- Ex-ante showerhead per unit savings estimates of 245 kWh and 0.018 kW are less than the ex-post per unit savings estimates of 285 kWh and 0.031 kW calculated in accordance with the IL-TRM V3.0. A difference between the ex-ante and ex-post per unit savings estimates could be that the implementer used Illinois home type information from the U.S. Energy Information Administration to estimate single-family and multi-family weighted average showerheads per household in conjunction with the prescribed single-family and multi-family values in IL-TRM V3.0. Instead, the evaluation team used home type information from the participant survey to calculate ex-post per unit savings. Despite the ex-post per unit kWh savings estimates being larger than ex-ante per unit kWh savings estimates, the ex-post gross kWh population savings is less than the ex-ante gross kWh population savings due to difference in installation rates used for the ex-post and ex-ante savings. The ex-ante gross savings used an ISR of 81%⁸ based off Illinois Statewide TRM V1 while the evaluation team used the 46% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings.
- Ex-ante water heater temperature card thermometer per unit savings estimates of 86.4 kWh and 0.010 kW are the same as the ex-post per unit deemed savings estimates defined in IL-TRM V3.0. The source of the ex-post gross population savings being less than the ex-ante gross population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The implementer estimated ex-ante savings using an ISR of 50%, while the evaluation team used the water heater temperature card thermometer-specific 23% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings.

⁷ Program assumptions confirmed by the implementer.

⁸ Program assumptions confirmed by the implementer.

Based on verified program participation, the program achieved total gross gas energy savings of 65,619 therms. Table 11 shows ex-ante and ex-post gross gas impacts.

Table 11. PY7 Program Ex-Ante and Ex-Post Gross Gas Impacts*

Measure	Ex-Ante Gross Impacts (therms)	Reported Measures ^a	Evaluated Installation Rate	Verified Measures ^b	Ex-Post Gross Impacts (therms)	Gross Realization Rate ^c
1.0 GPM Bath Faucet Aerator	6,102	6,423	41%	2,643	2,207	36%
2.0 GPM Dual Kitchen Faucet Aerator	6,102	6,423	43%	2,740	16,047	263%
1.75 GPM Chrome High Efficiency Showerhead	54,150	6,423	46%	2,966	37,851	70%
Hot Water Temperature Card Thermometer	20,555	6,423	23%	1,486	9,514	46%
Total	86,910	25,694	38%	9,834	65,619	76%

* Totals may not sum due to rounding.

^a Based on IL-TRM V3.0, we assumed 84% of total verified water saving measures were installed in homes with gas water heating.

^b The difference between reported measures and verified measures is due to the application of installation rates developed from the implementer's web-based survey for students.

^c Realization rates different from 1.0 are due to differences between ex-ante and ex-post per unit savings. Reported results are rounded. Gross realization rate = ex-post gross savings ÷ ex-ante gross savings.

The evaluation team received ex-ante gas savings estimates from the School Kits program implementer and reviewed the assumed estimates for comparisons to the ex-post savings methodologies. Ex-ante gas savings methodology assumptions and inputs were not made available to the evaluation team to enable a recreation of the claimed ex-ante gas estimates. Because of this, there are unknown differences between the ex-ante and ex-post gas savings assumptions for kit measures. The differences between total ex-ante and ex-post gas savings estimates are due to differences in the ex-ante and ex-post gross gas per unit savings. Described below are the discrepancies for each gas saving program measure:

- Ex-ante bathroom faucet aerator per unit savings estimate of 2.0 therms is more than the ex-post per unit savings estimate of 0.84 therms calculated in accordance with the IL-TRM V3.0. The implementer acknowledged they did not calculate separate savings estimates for the different aerator types and that they used 2.0 gross per-unit therm savings estimates for both kitchen faucet aerator and bathroom faucet aerator ex-ante gross savings calculations. Another source of the ex-post gross kWh population savings being less than the ex-ante gross kWh population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The ex-ante savings used an ISR of 48%⁹ based off Illinois Statewide TRM V1 while the evaluation team used the bathroom faucet aerator-specific 41% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings.
- Ex-ante kitchen faucet aerator per unit savings estimate of 2.0 therms is less than the ex-post per unit savings estimate of 5.86 therms calculated in accordance with the IL-TRM V3.0. The implementer acknowledged they did not calculate separate savings estimates for the different

⁹ Program assumptions confirmed by the implementer.

aerator types and that they used 2.0 gross per-unit therm savings estimates for both kitchen faucet aerator and bathroom faucet aerator ex-ante gross savings calculations. Another source of the ex-post gross population savings being more than the ex-ante gross population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The ex-ante savings used an ISR of 48% based off Illinois Statewide TRM V1 while the evaluation team used the kitchen faucet aerator-specific 43% ISR calculated from the student survey, in accordance with IL-TRM V3.0, to calculate the ex-post gross savings

- Ex-ante showerhead per unit savings estimates of 10.4 therms is less than the ex-post per unit savings estimate of 12.76 therms calculated in accordance with the IL-TRM V3.0. A possible difference between the ex-ante and ex-post per unit savings estimates could be that the evaluation team used home type information from the participant survey to estimate ex-post savings per unit. The implementer used Illinois home type information from the U.S. Energy Information Administration to estimate single-family and multi-family weighted average showerheads per household in conjunction with the prescribed single-family and multi-family values in IL-TRM V3.0. Despite the ex-post per unit kWh savings estimate being larger than ex-ante per unit savings estimate, the ex-post gross population savings is less than the ex-ante gross population savings due to difference in installation rates used for the ex-post and ex-ante savings. The ex-ante gross savings used an ISR of 81%¹⁰ based off Illinois Statewide TRM V1 while the evaluation team used the 46% ISR calculated from the student survey, in accordance with V3.0, to calculate the ex-post gross savings.
- Ex-ante water heater temperature card thermometer per unit savings estimate of 6.4 therms is the same as the ex-post per unit deemed savings estimate of 6.4 therms defined in IL-TRM V3.0. The source of the ex-post gross population savings being less than the ex-ante gross population savings is due to difference in installation rates used for the ex-post and ex-ante gross savings. The implementer estimated an ISR of 50% for ex-ante savings, while the evaluation team used the water heater temperature card thermometer-specific 23% ISR calculated from the student survey, in accordance with Illinois IL-TRM V3.0, to calculate the ex-post gross savings.

In addition to gross savings achieved because of measure installations in PY7, the evaluation team calculated gross savings from delayed CFL installations per the Illinois Statewide TRM V3.0. In particular, IL-TRM V3.0 assumes that consumers will install 98% of kit CFLs within three years and that they will never install the remaining 2% of bulbs. Table 12 provides the savings values from bulbs provided to participants in PY7 that are realized in PY7, as well as in PY8 and PY9 given later installations.

Table 12. Yearly Gross Impact of PY7 Residential Lighting Measures by Assumed Installation Year

Measure	Energy (MWh)			Demand (MW)		
	PY7	PY8	PY9	PY7	PY8	PY9
EcoSave 13-watt CFL	328	63	54	0.035	0.007	0.006

The evaluation team will include the PY8 and PY9 savings in future evaluation reports.

¹⁰ Program assumptions confirmed by the implementer.

3.11.2 Net Impacts

Based on verified program participation, the IL-TRM V3.0 deemed per-unit gross savings values, and SAG-approved NTGRs, the program achieved total net electric savings of 532MWh and demand savings of 0.078 MW. Table 13 shows the net electric savings results by measure.

Table 13. PY7 Total Program Net Electric Savings by Measure*

Measure	NTGR ^a	Ex-Ante Net Savings (MWh)	Ex-Ante Net Savings (MW)	Ex-Post Net Savings (MWh)	Ex-Post Net Savings (MW)
EcoSave 13-watt CFL	0.85	260	0.028	278	0.029
1.0 GPM Bath Faucet Aerator	1.0	26	0.013	9	0.013
2.0 GPM Dual Kitchen Faucet Aerator	1.0	26	0.013	68	0.017
1.75 GPM Chrome High Efficiency Showerhead	0.94	228	0.017	151	0.017
Hot Water Temperature Card Thermometer	1.0	53	0.006	24	0.003
Total	0.90^b	593	0.076	532	0.078
Net Realization Rate^c				90%	103%

* Totals may not sum due to rounding.

^a SAG-approved NTGR used for ex-ante net savings and ex-post net savings.

^b Estimate is weighted by ex-post MWh savings. Weighted by ex-post MW savings NTGR is 93%.

^c Net realization rate = ex-post net savings ÷ ex-ante net savings.

Based on verified program participation, the IL-TRM V3.0 deemed per-unit gross savings values, and SAG-approved NTGRs, the program achieved total net gas savings of 63,726 therms. Table 14 shows the net gas savings results by measure.

Table 14. PY7 Total Program Net Gas Savings by Measure*

Measure	NTGR ^a	Ex-Ante Net Savings (therms)	Ex-Post Net Savings (therms)
1.0 GPM Bath Faucet Aerator	1.0	6,102	2,207
2.0 GPM Dual Kitchen Faucet Aerator	1.0	6,102	16,047
1.75 GPM Chrome High Efficiency Showerhead	0.95	51,442	35,959
Hot Water Temperature Card Thermometer	1.0	20,555	9,514
Total	0.97^b	84,202	63,726
Net Realization Rate^c			76%

* Totals may not sum due to rounding.

^a SAG-approved NTGR used for ex-ante net savings and ex-post net savings.

^b Estimate is weighted by ex-post gross therm savings.

^c Net realization rate = ex-post net savings ÷ ex-ante net savings.

4. Conclusions and Recommendations

The PY7 School Kits Program delivered 7,647 kits to students. In its second year, the program continued to establish relationships with schools to secure future participation and improve marketing methods to increase participation from additional schools. Although the utility and implementation staff are satisfied with the program, the evaluation team has identified the following recommendations for future program years.

- **Conclusion #1:** The participant survey response rate dropped from 55% in PY6 to 23% in PY7. While we found no obvious reason for this change, student response rates typically depend on the amount of teacher encouragement or requirement for completion. Teachers may perceive that chances of having the “highest” participation and winning the \$250 gift card are slim. Furthermore, the evaluation team is concerned that the survey data may not be representative of the entire program population due to the low response rate.
- **Recommendation:** AIC and the program implementers may want to consider offering every teacher an incentive or eligibility for a drawing based on a threshold proportion of surveys received. Another option is to add an incentive to the students and families such as a chance to win a gift card or a token gift in exchange for completing the survey.
- **Conclusion #2:** The evaluation team used results from the implementer’s participant surveys as input to the program savings calculations. In the PY6 evaluation, we recommended modifications to the tracking system. These changes were not made for PY7 since the evaluation was completed mid-year. As such, we provide these same recommendations below:
- **Recommendation:** Consider having the survey reviewed by a third-party evaluator to ensure that the participant survey responses provide the data needed to best estimate program savings. Alternatively, consider making the following modifications to the online survey instrument:

Conclusions and Recommendations

- Capture installation rate for each CFL wattage if more than one wattage of bulb is included in the kit in future program years¹¹
- Determine if participants adjusted water heater temperatures up or down
- Determine fuel saturation for all participants
- Collect number of people per household
- Determine single-family or multifamily residence
- Determine number of bathroom faucets and showerheads per household
- Remove inconsistencies that occurred and were reported in PY6 and occurred again in PY7. For example, survey questions that differ and result in different response choices and answers (e.g., school Kits survey data indicating CFL installations included these responses: “Yes,” “No,” “0,” “1,” and “2.”)

¹¹ The PY7 kit included only 13-watt CFLs.

A. Appendix: Data Collection Instruments

A.1.1 AIC Residential Energy Efficiency School Kits Program Process Evaluation PY7 Program Staff Interview Guide

Name of Interviewee, Title:	Date:
Program: School Kits	Utility: Ameren Illinois (AIC)

Interview Introduction

The following questions are designed to help the evaluation team gain insight to how the School Kits Program is being implemented on the ground and to learn about the experiences of program managers and implementers during PY7. We will ask questions about program status with respect to goals, design and implementation effectiveness, participation barriers, and future expectations. This interview will provide key inputs that the process evaluation team can use to answer key research questions. It is not meant to be an individual evaluation or report on your performance. However, your valuable insights are much appreciated and we hope that you will be as open as possible in sharing your views on how the program is working and how it can be improved.

Roles and Changes

1. Please describe your role in the School Kits Program. Has your role changed at all since last year?
2. Have you added any staff to support the program? If so, who and in what capacity?
3. Whom do you report to and what kind of reporting is provided?

Program Goals

4. What are the overall goals of the Ameren programs? How does the School Kit fit into that?
5. What are the plans for this program moving forward?
6. Is the program meeting its goals? Why or why not?
7. What about process-related goals such as increased awareness and customer satisfaction?
8. In your opinion, how has the program performed so far in PY7 (in terms of both process and savings/participation goals)? Why do you think this is?

Program Design, Management, and Implementation

9. Can you take me through the program process from start to finish for the rural kits delivery channel?
10. Have there been any changes to the program design/delivery since PY6?
 - a. What about any changes to the kits?
11. [For Utility PMs] What has been your experience working with the implementation and administration contractors? What are they doing well? What could be improved?
 - a. Is the program functioning smoothly?
 - b. What is the customer management-complaints response protocol?

Appendix: Data Collection Instruments

- c. Is communication and reporting about the program satisfactory?
 - d. Website management?
 - e. Training?
 - f. QAQC/verification of installations?
 - g. Is there a program manual? If so, could you send it to us?
12. [For Implementation/Admin Partner] What has been your experience working with the utility? Are they providing adequate support / information for you to implement the program?
- a. Is the program functioning smoothly?
 - b. Is communication and feedback from the utility satisfactory?

Budget and Data Tracking

13. What was the program budget this year? How do you allocate it across administration, incentives, and marketing, etc.? Was the program budget sufficient to support implementation and achievement of program goals?
14. How do you track data? How is the data tracking system working this year? Have you made any changes to the way you track data or the kind of data tracked in the last year?
- a. Is data tracking sufficient for your needs?
 - b. Do you have any recommendations for changes to the online survey used to collect data from participants?

Program Marketing

15. Have marketing efforts been successful?
16. How do you track the results of marketing efforts.

Results: Customer Feedback

17. What participation challenges exist for school-based and direct mail customers?
18. How are savings verified for this program?
19. Was the follow-up survey successful? What kind of response rate did you receive? Were the results what you expected?
20. What outside influences do you believe may be impacting participation (e.g. economy, other programs, tax incentives, weather) this year?

General Achievement and Future Challenges

21. Please describe any major successes so far for the program this year?
22. What do you expect to be the biggest challenges going forward? Barriers to participation?
23. What are your future plans for this program?

Wrap-Up

24. How can our evaluation be made more useful to you? Our recommendations?
25. Do you have any final questions or comments about the program that you want to ask or share?

Appendix: Data Collection Instruments

Thank you very much for taking the time to assist us with this evaluation. Your contribution is a very important part of the process. Do you mind if we follow-up with you by phone or e-mail later, if additional questions arise?

B. Appendix: Program Collateral

The program implementers recruit schools to participate in the program through direct mail marketing and by using the program brochure. These materials follow in Figure 3 through Figure 5.

Figure 3. Educator Letter

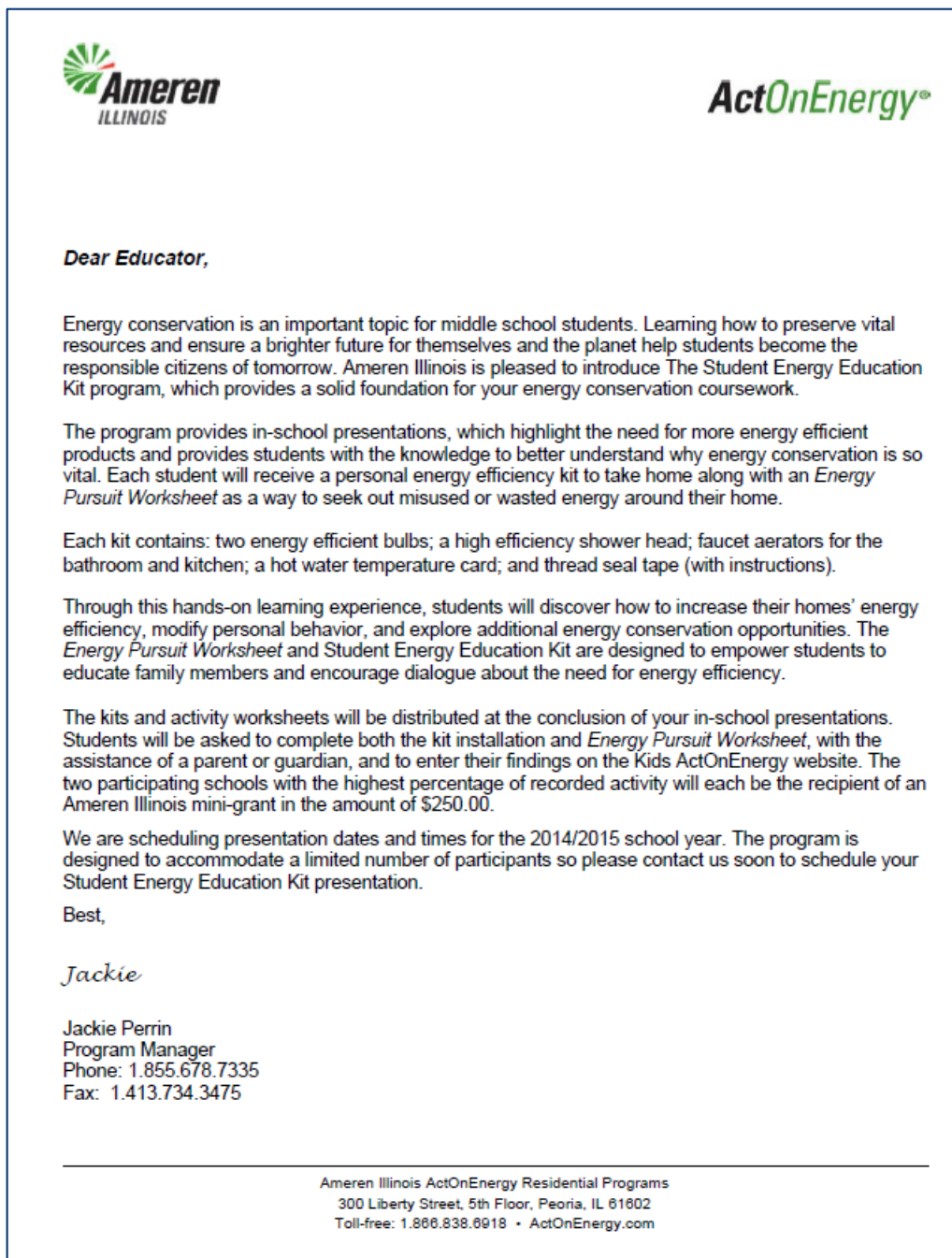


Figure 4 and Figure 5 show the brochure that the program implementers distribute to the schools.

Figure 4. Side A of the Program Marketing Brochure Provided to Teachers and School Administrators

SIGN UP!

Participation in the Student Energy Education Kit Program is free of charge for eligible schools. Please complete this form to get started. E-mail: jackiep@appliedproactive.com
Fax: 1.413.734.3475
Questions? Call: 1.855.678.7335

School Name: _____

Address: _____

City: _____ State: _____ Zip: _____

When would you like to participate?


How many students will be participating?

Educator / Administrator
Contact Information


Name: _____

E-mail: _____

Phone: _____




KidsActOnEnergy.com
An Ameren Creation




when it comes to saving energy, your actions matter


When it comes to energy, actions speak louder than words. That's why we work hard to make sure you have the energy you need. And it's why we put savings tools in your hands—so you can take action.

The Ameren ActOnEnergy® efficiency programs are designed to help Ameren Illinois customers pay for home energy efficiency improvements. Discounts, incentives, rewards and rebates are available for: insulating; air sealing; heating and cooling upgrades; home energy audits; refrigerator recycling; and even building a new home! Go to ActOnEnergy.com to learn more.



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STUDENT Energy Education Kit




Figure 5. Side B of the Program Marketing Brochure Provided to Teachers and School Administrators

KEY BENEFITS OF THE PROGRAM

Students are motivated to take a proactive stance on energy efficiency.

Students and parents partner to implement simple home energy conservation measures.

Students gain valuable information with which they may educate others on simple steps to a more energy efficient home.

Family members may participate in the energy pursuit and identify ways to reduce energy demand.

Schools realize the benefit of educating a generation of citizens on the efficient use of energy and natural resources.


IN-SCHOOL PRESENTATION

Unique program designed specifically for middle school students.

Presentations provide knowledge to better understand the need for energy conservation.

Students examine their current energy use and consider practical behavioral modifications.

DVD PowerPoint presentation provides visual illustration, encourages dialogue with the educational presenter and classmates, and promotes responsible home energy usage.




STUDENT ENERGY EDUCATION KITS

Each participating student will receive their own personal home energy efficiency kit.

Each Kit Contains:

- Two 13W compact fluorescent light bulbs (CFLs)
- 1.75 gpm showerhead, chrome finish
- 2.0 gpm kitchen aerator
- 1.0 gpm bath sink aerator
- Hot water temperature card thermometer
- Energy pursuit activity worksheet
- Parent letter explaining the overall program, CFL recycling information, and additional program information available through Ameren Illinois



MAKE a B.i.G. impact

BROADENS

knowledge of energy efficiency and conservation

INSPIRES

environmental stewardship

GUIDES

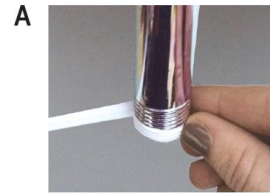
implementation of home energy efficiency measures

The kit contains the measures and instructions for the thread tape (to be used when installing the aerators and showerhead). The thread tape instructions shown in Figure 6 are thorough and clear.

Figure 6. Instructions Included in the School Kit

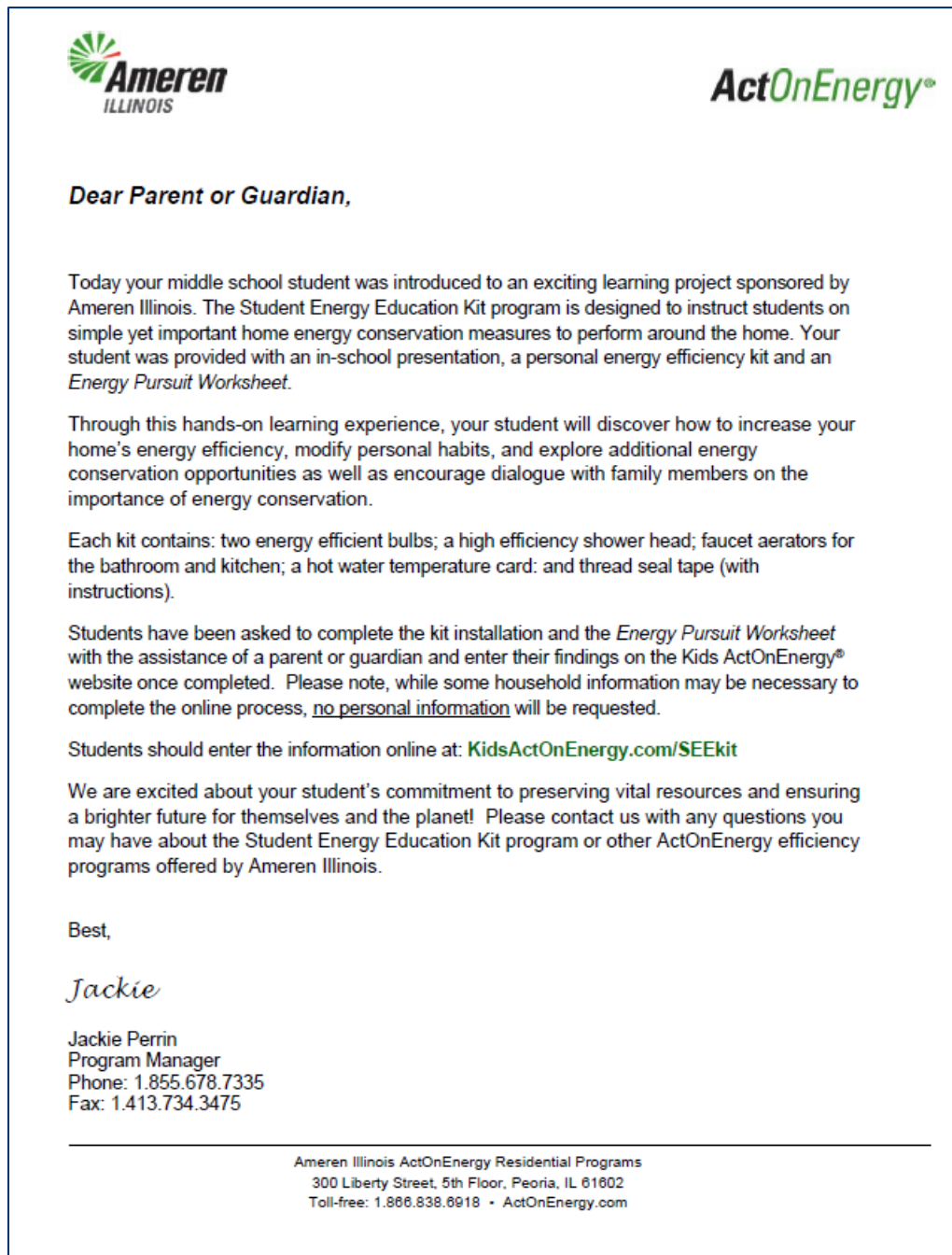
Thread seal tape is a great way to ensure that you get a watertight seal on pipe joints. When used correctly, thread seal tape can help ensure that threaded connections come together smoothly as well as preventing leaks. To help get the most out of your thread seal tape, you need to make sure you are using it correctly.

1. Start by cleaning the male threads at the end of the pipe with a clean rag.
2. Place the end of the thread seal tape on the second thread in and hold it in place with one hand. **(A)**
3. Wrap the tape in the same direction of the threads.
4. Keep tension on the tape and wrap it several times working away from the end of the pipe.
5. When you have finished wrapping the tape, smooth the loose end down into the threads. **(B)**



There is also a letter to the parents that is sent home with the students as shown in Figure 7.

Figure 7. Letter to Parents



C. Appendix: Other Cost Effectiveness Inputs

Heating Penalty Results

Efficient lighting products generate less waste heat compared to baseline lighting products. When customers replace baseline products with more efficient lighting, they must use more space heating to compensate for the “lost” heat from lighting. The heating penalty represents this increased gas usage for space heating. The penalty is used in the analysis of program cost effectiveness.

Table 15 shows the gas-heating penalty that results from the additional space heating needed when customers install efficient lighting. The Evaluation Team used IL-TRM V3.0 to calculate these impacts.

Table 15. Gas Heating Penalty

Measure	Heating Penalty (Therms)		
	PY7	PY8	PY9
EcoSave 13-watt CFL	-6,026	-1,160	-993

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