



Opinion **Dynamics**

Boston | Headquarters

617 492 1400 tel
617 497 7944 fax
800 966 1254 toll free

1000 Winter St
Waltham, MA 02451



Ameren Illinois Company Electric & Gas Residential, and Commercial and Industrial Energy Efficiency Portfolios - PY6 Integrated Evaluation Report

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CADMUS

NAVIGANT


MichaelsEnergy



Contributors

Hannah Arnold
Managing Director, Opinion Dynamics

Zach Ross
Senior Analyst, Opinion Dynamics

Jane Colby
Principal, Cadmus

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1. Executive Summary

This document contains the evaluation results from the sixth program year (PY6) of the Ameren Illinois Company (AIC) portfolio of commercial and industrial (C&I) and residential energy efficiency resources.¹ PY6 began on June 1, 2013 and ended on May 31, 2014. AIC contracted Opinion Dynamics, along with its subcontractors The Cadmus Group, Navigant Consulting, and Michael's Energy (the team), to provide an independent evaluation of the 2011-2014 electric and natural gas energy efficiency programs. In this document, we provide the integrated portfolio results for PY6, as well as the detailed findings for each program as appendices.

Overall Results

At the portfolio level, the AIC programs exceeded their filed savings goals for PY6.² As Table 1 illustrates, the net realization rates for the entire portfolio are 141% for MWh and 128% for therms. For additional detail regarding PY6 savings, including lifetime savings, program costs, and participation see Appendix A.

Program performance as measured against the filed program goals was extremely strong in many cases across both the residential and commercial portfolios. On the electric side, the performance of the Residential Lighting Program made the greatest contribution to achieving the portfolio goals. This program achieved 10% more of the overall portfolio MWh than originally expected (from 20% of the portfolio's planned impacts to 30% of the actual). On the natural gas side, the residential Behavioral Modification Program and C&I Standard programs performed much better than planned. The Behavioral Modification Program achieved 29% of the portfolio gas goal compared to the 14% planned while the C&I Standard Program achieved 20% of the goal compared to the 6% planned. In addition, based on supporting funds from 8-104, AIC achieved gas savings through the Energy Efficiency Kits Program, a program provided under the Illinois Power Agency (IPA).

¹ For simplicity, this report refers to the period of study as PY6. However, the June 2013 to May 2014 program year is composed of Electric Program Year 6 (EPY6) and Gas Program Year 3 (GPY3).

² AIC's goals are at the portfolio level. The utility does not have to meet program-specific goals.

Table 1. PY6 Portfolio Ex Post Impacts Compared to Planned Impacts

Program	Planned Impacts ^a		Ex Post Gross		Ex Post Net Impacts		Realization Rate ^b	
	MWh	Therms	MWh	Therms	MWh	Therms	MWh	Therms
Residential Portfolio								
Residential Lighting	42,418	-	194,665	-	91,493	-	2.16	-
Behavioral Modification	21,705	664,517			41,051	1,809,293	1.89	2.72
Appliance Recycling	16,036	-	8,466.00	-	5,326.00	-	0.33	-
HVAC	15,109	1,480,704	12,373	1,540,896	7,300	1,186,946	0.48	0.80
Efficient Products	13,110	552,133	1,545	109,111	1,274	98,200	0.10	0.18
Multifamily	5,285	313,078	9,286	100,815	9,075	100,143	1.72	0.32
Home Performance with ENERGY STAR	2,728	107,034	4,261	503,875	3,883	411,594	1.42	3.85
Moderate Income	1,800	68,799	617	173,380	617	173,380	0.34	2.52
ENERGY STAR New Homes	329	15,449	443	23,193	354	18,554	1.08	1.20
Energy Efficiency Kits ^d	N/A	N/A	-	62,574	-	33,832	-	-
<i>Residential Total</i>	<i>118,521</i>	<i>3,201,714</i>	<i>231,656</i>	<i>2,513,844</i>	<i>160,373</i>	<i>3,831,942</i>	<i>1.35</i>	<i>1.20</i>
C&I Portfolio								
Custom	57,102	270,412	99,277	1,836,207	78,380	1,255,610	1.37	4.64
Standard	37,334	1,429,883	81,024	991,163	55,525	972,082	1.49	0.68
Retro-Commissioning	3,019	4,651	10,892	248,851	10,347	236,408	3.43	50.83
<i>Commercial Total</i>	<i>97,456</i>	<i>1,704,945</i>	<i>191,193</i>	<i>3,076,221</i>	<i>144,252</i>	<i>2,464,100</i>	<i>1.48</i>	<i>1.45</i>
Portfolio Total ^c	215,977	4,906,659	422,849	5,590,065	304,625	6,296,042	1.41	1.28

^a Source: AIC Compliance Filing, p. 28, Docket 10-0568 (Filed January 20, 2011). [Accessed: <http://www.icc.illinois.gov/docket/files.aspx?no=10-0568&docId=160813>]

^b The realization rate = ex post net impacts ÷ planned impacts.

^c Note that the total may not equal the sum of the values in the column due to rounding.

^d Gas savings from the Energy Efficiency Kits Program are the result of supporting 8-104 funds for this IPA program.

Executive Summary

Key findings for specific programs are:

- The Residential ENERGY STAR New Homes program saw a notable increase in participation. Program-tracking data showed a 74% increase in participation over PY5, with more builders and raters participating than ever before. Further, program-eligible homes accounted for approximately 11% of all new homes built within the AIC service territory.
- The Residential Lighting evaluation found that overall CFL saturation increased from 33% in 2012 to 38% in 2014. This increase is due entirely to an increase in CFL saturation in standard light sockets. CFL saturation in standard sockets increased from 40% in 2012 to 49% in 2014 but remained essentially the same in specialty sockets (18% in 2012 compared 16% in 2014 – a change that is not statistically significant).
- The Home Performance with ENERGY STAR Program saw a large drop-off in program participation in PY6, which may be due in part to a decline in trade ally support for the program. On the other hand, PY6 saw a greater emphasis on more comprehensive retrofits with the number of gold and silver Energy Star certificates significantly increasing. Further, the evaluation found large increases in the average per household savings from PY5 to PY6.
- On the C&I side, the Retro-Commissioning program has continued to expand through additional offerings to business customers and significantly exceeded both its electric and gas savings goals.

2. Introduction

This report presents results from the evaluation of the sixth program year (PY6) of AIC's 12 energy efficiency programs. For PY6, the portfolio of residential and commercial programs included the following:³

- Residential Lighting
- Residential Behavioral Modification
- Residential HVAC
- Residential Energy-Efficient Products
- Residential Appliance Recycling
- Residential Multifamily
- Home Energy Performance with ENERGY STAR® (including the Electric Space Heat Pilot)
- Residential ENERGY STAR® New Homes
- Residential Moderate Income
- Commercial & Industrial (C&I) Standard
- Commercial & Industrial (C&I) Custom (including some New Construction projects)
- Commercial Retro-commissioning

The subsequent sections of this report present high-level findings from the evaluation of the PY6 programs (see Appendix C for information on the Energy Efficiency Kits Program). Within the Introduction, we also provide context around AIC's portfolio savings goals and resources, as well as an overview of the evaluation approach.

2.1 Overview of the AIC Portfolio

The PY6 portfolio had energy goals of slightly over 216 GWh and 4.9 million therms. Goals are at the portfolio level, not at the program level. To increase the likelihood of achieving the portfolio goals, AIC has the ability to shift resources across all programs. AIC has energy goals (i.e., MWh and therms), but no statutory requirement for demand goals (MW). Table 2 presents the AIC energy goals by program.

³ While not part of AIC's energy efficiency portfolio, gas savings from the Illinois Power Agency Energy Efficiency Kits Program are included in this report given that AIC provided supporting 8-104 funds to procure them.

Table 2. Portfolio Planned Savings by Program Year

Program	TRC	Annual MWh Savings			Annual MW Savings			Annual Therm Savings		
		PY4	PY5	PY6	PY4	PY5	PY6	PY4	PY5	PY6
RES-Lighting	2.3	82,485	61,974	42,418	2.5	1.9	1.3	0	0	0
RES-Behavioral Modification	1.7	21,705	21,705	21,705	4.9	4.9	4.9	664,517	664,517	664,517
RES-HVAC	1.4	13,448	14,187	15,109	6.4	6.8	7.2	896,800	1,147,316	1,480,704
RES-Energy-Efficient Products	1.5	11,079	11,999	13,110	2.3	2.4	2.7	324,590	463,622	552,133
RES-Appliance Recycling	2	19,889	20,070	16,036	2.9	2.9	2.3	0	0	0
RES-Multifamily	1.9	4,874	5,217	5,285	0.9	1	1	247,116	290,831	313,078
RES-Home Energy Performance	1.4	2,593	2,665	2,728	0.7	0.7	0.7	100,890	103,916	107,034
RES-Moderate Income	1.4	1,732	1,774	1,800	0.5	0.5	0.5	64,850	66,795	68,799
RES-New Construction	1	273	304	329	0.1	0.1	0.1	12,831	14,268	15,449
RESIDENTIAL Portfolio Total	1.7	158,078	139,895	118,521	25.5	25.6	25.1	2,311,593	2,751,267	3,201,714
BUS-Standard	1.7	47,815	40,648	37,334	20.2	17.2	15.8	1,145,345	1,306,813	1,429,883
BUS-Custom	2	55,620	54,490	50,648	16.3	15.9	14.8	189,043	210,919	223,281
BUS-New Construction	1.3	8,194	7,123	6,454	2.9	2.5	2.2	51,483	50,035	47,131
BUS-RCx	3	3,309	3,196	3,019	0.8	0.8	0.7	5,654	5,002	4,651
BUSINESS Portfolio Total	1.8	114,938	105,458	97,456	40.1	36.3	33.5	1,391,525	1,572,768	1,704,945
AIC PORTFOLIO TOTAL	1.8	273,534	245,871	216,495	65.6	61.9	58.7	3,735,017	4,355,658	4,942,447

Source: AIC Compliance Filing, p. 28, Docket 10-0568 (Filed January 20, 2011). [Accessed: <http://www.icc.illinois.gov/docket/files.aspx?no=10-0568&docId=160813>]

In terms of portfolio costs, AIC's annual costs are close to \$60 million. Table 3 provides the costs by program.

Table 3. Portfolio Planned Costs, by Program Year

Program	Annual Program Costs (\$ millions)					
	PY4		PY5		PY6	
RES-Lighting	\$	7.00	\$	5.21	\$	3.74
RES-HVAC	\$	6.84	\$	8.07	\$	9.69
RES-Energy-Efficient Products	\$	3.31	\$	3.59	\$	3.99
RES-Appliance Recycling	\$	2.66	\$	2.77	\$	2.28
RES-Multifamily	\$	1.56	\$	1.79	\$	1.97
RES-Home Energy Performance	\$	1.35	\$	1.41	\$	1.48
RES-Behavioral Modification	\$	0.96	\$	0.99	\$	1.02
RES-Moderate Income	\$	0.83	\$	0.87	\$	0.91
RES-New Construction	\$	0.18	\$	0.21	\$	0.23
RESIDENTIAL Portfolio Total	\$	25.76	\$	26.10	\$	26.50
BUS-Standard	\$	12.06	\$	12.50	\$	13.15
BUS-Custom	\$	11.17	\$	11.40	\$	10.91
BUS-New Construction	\$	2.20	\$	2.11	\$	2.06
BUS-RCx	\$	0.28	\$	0.28	\$	0.28
BUSINESS Portfolio Total	\$	25.71	\$	26.20	\$	26.39
AIC Portfolio Admin Costs	\$	2.57	\$	2.60	\$	2.64
AIC EM&V Costs	\$	1.54	\$	1.56	\$	1.59
AIC Education Costs	\$	1.29	\$	1.30	\$	1.32
AIC PORTFOLIO TOTAL	\$	58.35	\$	59.30	\$	59.96

Source: AIC Compliance Filing, p. 32, Docket 10-0568 (Filed January 20, 2011).

[Accessed: <http://www.icc.illinois.gov/docket/files.aspx?no=10-0568&docId=160813>]

2.2 PY6 Evaluation Approach

The PY6 evaluation plan served as the foundation for the evaluation activities conducted. The evaluation approach included both program- and non-program-specific activities, including efforts to support the Illinois Statewide Technical Reference Manual for Energy Efficiency (IL-TRM) process. The team implemented all aspects of the evaluation plan for PY6.

Table 4 provides a summary of the evaluation activities performed by the team. Detailed information about the data collection activities and analyses performed for each program is included in Appendix A.

Table 4. PY6 Evaluation Activities and Type of Assessment

Evaluation Activity	Residential									Commercial		
	Lighting	HVAC	Behavioral Modification	Home Performance with ENERGY STAR®	Appliance Recycling	Multifamily	Moderate Income	Efficient Products	ENERGY STAR New Homes	Standard	Custom	RCx
Program Material Review												● Every Program
Program Manager and Implementer Interviews												● Every Program
Energy Advisor or Key Account Executive Interviews										●		
Market Actor / Program Ally / Retailer Interviews		●								●	●	
Participant Survey	●	●	●	●		●			●	●	●	
Ex Post Gross Assessment												
Site Visits	●									●	●	
Applied IL-TRM determined savings values to verified participation value	●	●		●	●	●	●	●		●		
Calculated savings using research			●		●				●	●	●	●
Ex Post Net Assessment												
Applied deemed NTGR	●	●		●	●	●	●	●	●	●	●	●
Retrospective application of researched NTGR												
Performed NTGR research for prospective use	●	●		●	●	●			●		●	●

In addition to the activities outlined above, the evaluation team conducted a number of non-program-specific activities. We provide an overview of each activity below.

- **TRM Efforts:** Throughout PY6, the evaluation team reviewed documents and measure protocols submitted to the Stakeholder Advisory Group (SAG) by the Vermont Energy Investment Corporation (VEIC), and, as necessary, provided comments. In addition, we participated in a NTG Methodology Working Group tasked with developing protocols for NTG research across the utilities.
- **Coordination with Illinois Utilities:** As part of the evaluation planning process and as needed throughout the program year, the evaluation team consulted with their counterparts supporting evaluation efforts for other utilities in the state. These discussions helped to identify similarities and differences in approach, as well as to inform ongoing discussions of the NTGR framework and its application.
- **Cost-Effectiveness Analysis:** The team is preparing model inputs of evaluated program savings as determined through the evaluation effort for AIC. As needed, the team will also audit AIC’s cost-effectiveness analysis based on this year’s program results. This may include a review of AIC’s assumptions for avoided costs, discount rates, measure cost information, administrative costs, and other relevant data.

3. Portfolio Results

3.1 Residential Lighting

Launched in August 2008, the Lighting Program has as its aim the eventual transformation of the residential lighting market in AIC territory. It works to increase residential customers' awareness and use of ENERGY STAR® (ES) lighting products by providing discounts and by undertaking marketing and outreach efforts at participating retailers, community events, and on the AIC website. The discounts offered by the program and its retail and manufacturing partners bring the cost of ES lighting closer to that of less-efficient options. They encourage customers who are reluctant to pay full price for ES lighting to choose energy-efficient over standard lighting. During its six years, the program has discounted 17,051,292 energy efficient light bulbs and fixtures.

The Residential Lighting Program is implemented by Conservation Services Group (CSG) and subcontractors Applied Proactive Technologies (APT) and Energy Federation, Incorporated (EFI). It is part of the 8-103/IPA expansion, and the expected savings from this program represent 20% of AIC's portfolio of electric savings and 0% of portfolio therm savings (including residential and commercial customers).⁴

To evaluate the program's performance, we conducted in-depth interviews with program staff, reviewed program data and program materials, interviewed customers who were purchasing lighting at participating retailers, and undertook a stocking study of lighting products at participating retailers. We also conducted an in-home lighting audit, and consumer preferences survey.

Impact Results

The Residential Lighting Program sold 4,659,601 bulbs in PY6, which is a 65% increase from PY5. Bulbs were sold at participating retail sites as well as an online website managed by AIC. While a large majority of bulbs sold were standard CFLs (82%), the program sold a greater percentage of specialty CFLs in PY6 (18%) than it did in PY5 (13%).⁵ LEDs were not a focus of the program and were only sold through the on-line store. They accounted for less than 1% of program sales. The Web store sold less than 1% of all bulbs sold through the program (see Table 5).

⁴ Note that the percentage of expected savings here and through the plan is calculated based on the AIC Filing dated January 20, 2011, which includes non-residential new construction.

⁵ Throughout this report, we use the program definition of standard versus specialty CFLs. A standard CFL is a spiral bulb that does not have any special functions. A specialty CFL either has glass covering the spiral, can be dimmed, can function as a 3-way bulb, or has other special functions.

Table 5. Bulb Sales by Type and Sales Channel

Bulb Type	Markdown	Web Store	Total
Standard CFL	3,808,116	323	3,808,439
Specialty CFL	850,195	250	850,445
LEDs	0	717	717
Total	4,658,311	1,290	4,659,601

The carryover savings method outlined in the IL-TRM Version 2.0 (June 7, 2013) spreads program savings across the three years customers take to install all of the bulbs they purchase. For evaluation purposes, AIC chose to begin using this method in PY4. As a result, PY6 savings come from bulbs *installed* in PY6 but that could have been *purchased* in PY4, PY5, or PY6. As shown in Table 6, the program achieved a net energy impact of 91,493 MWh and a net demand impact of 11.32 MW.

Table 6. PY6 Residential Lighting Program Impacts

Measure	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
Total MWh	187,776	1.04	194,665	0.47	91,493
Demand Savings MW					
Total MW	19.81	1.22	24.09	0.47	11.32

The Residential Lighting Program’s realization rate for PY6 net demand savings is 1.30, and the realization rate for net energy savings is 1.11.

Ex-post savings is different from ex ante savings due to the following methodological reasons:

- The program savings method assumes that 100% of program sales are installed in residential spaces. Our evaluation determined that 4% of bulbs are installed in commercial spaces, which have greater hours of use and different waste heat factors. As a result, ex post gross savings are 11.6% higher than ex ante gross savings for both energy (MWh) and demand (MW).
- The program savings method uses an In-Service-Rate (ISR) of 1.00, which assumes that 100% of bulbs purchased in PY6 are installed in PY6. Our evaluation uses the carryover method outlined in the IL-TRM Version 2.0 and assumes a first year ISR value of 0.695, and includes savings from a portion of sales made in PY4 and PY5 but not installed until PY6. For sales of PY6 bulbs, ex post energy savings (MWh) are 29.2% lower and ex post demand savings (MW) are 4.2% lower than ex ante energy and demand savings because of the first year ISR. For sales of PY4 and PY5 bulbs installed in PY6, ex post energy savings (MWh) are 25.1% higher and ex post demand savings (MW) are 28.9%. Combined, ex post gross energy savings (MWh) are 4.1% lower and ex post gross demand savings (MW) are 24.7% higher than ex ante gross savings due to the application of the carry over savings method.
- The program savings method uses different hours of use (HOU) than the IL-TRM Version 2.0 recommends. Our evaluation uses the HOU provided in the IL-TRM Version 2.0, which are higher for standard bulb types and, in most cases, lower for specialty bulb types. As a result, ex post gross energy savings (MWh) are 14.3% higher than ex ante gross savings.

Portfolio Results

- The program savings method uses lumens to determine base wattages, but used a different conversion than that provided in the IL-TRM Version 2.0. Some program base wattages were too high and some too low so that across all sales the impact was small. In addition, our audit of lumen values identified incorrect values for two products, resulting in different base wattages for less than 0.01% of bulbs sold. Combined, ex post gross savings are 1.1% higher than ex ante gross savings for both energy (MWh) and demand (MW).
- The program savings method does not use waste heat factors in the ex ante savings calculations. The evaluation team applied the waste heat factors recommended in the IL-TRM Version 2.0 to calculate ex post energy and demand savings. As a result, ex post gross energy savings (MWh) are 6.2% higher and ex post gross demand savings (MW) 11.5% higher than ex ante gross savings.
- The program savings method uses different summer peak coincidence factors than the IL-TRM Version 2.0 recommends. Our evaluation team applied the TRM-recommended values to the evaluated demand savings. As a result, ex post gross demand savings (MW) are 23.2% higher than ex ante gross savings.
- The program used a net-to-gross ratio (NTGR) of 0.44 to estimate net saving whereas the evaluation team used the PY5 net-to-gross ratio (NTGR) of 0.47 to estimate net ex-post savings. Both values are from the PY5 Lighting Impacts evaluation. The lower value was from a draft early results memo, which the evaluation team revised slightly for the final report after applying weights based on final PY5 sales data.
- The program savings methods does not account for bulbs sold to non-AIC customers. We applied an overall leakage rate of 11%, which accounts for AIC-discounted bulbs sold to non-AIC customers as well as bulbs discounted by other utilities but purchased by AIC customers. As a result, ex post gross energy (MWh) and demand (MW) savings are 11% lower than ex ante savings.

Process Results

The Residential Lighting Program ran smoothly in PY6. The program met its goals in terms of bulbs sold and exceeded the sales of any previous program year, and PY5 in particular by 65%. A program objective was to increase sales of specialty CFLs. To meet this goal, program administrators increased the incentive on specialty CFLs and saw the sale of specialty CFLs increase from 13% of all bulb sales in PY5 to 18% in PY6.

In PY6, a key marketing tactic used by the Residential Lighting Program was point-of-purchase (POP) sales materials at participating retail stores. Our in-store stocking study found materials promoting the presence of AIC-discounted CFLs at seven of the eight participating stores we visited and found additional AIC materials describing the benefits of CFLs at seven of the stores.

The program employs seven field representatives who are assigned responsibility for specific stores across AIC territory. Field representatives visit participating retailers on a regular basis to ensure that products and promotional materials are displayed properly and provide retailer training. Field representatives also held 147 in-store lighting demonstrations to promote the program and educate customers about CFLs. Our analysis of the in-store customer interviews show that these events increase sales of energy-efficient lighting at the time of the demonstration. Customers who purchased light bulbs while a lighting demonstration was taking place were more likely to purchase efficient lighting than customers who purchased light bulbs outside of an event. During an event, 73% of customers who purchased bulbs purchased CFLs compared to 56% of customers when an event was not present.

Portfolio Results

We conducted a number of research studies to gain information on the state of the lighting market in AIC territory. Combined, these studies show that customer use of standard CFLs is increasing. However, despite the increase in sales of program-discounted specialty CFLs in PY6, significant barriers remain to CFL use for specialty lighting needs. The following paragraphs provide key findings from these studies.

EISA is having an impact on stocking practices with fewer stores carrying 100 and 75-watt standard incandescent bulbs. Energy-efficient bulb types—CFLs and LEDs—comprised a majority of the lighting products on retailers' shelves, but we found large differences in product availability by lumen output. While energy-efficient bulbs make up the majority of bulbs stocked, incandescent bulbs are still available across lower lumen ranges. At the eight participating retailers where we performed inventories, no 100- or 75-watt equivalent standard incandescents were available, but incandescents still made up 13% of 60-watt equivalent products and 32% of 40-watt equivalent products stocked. We found 100 and 75-watt incandescents at 22% of the 139 retailers we called as part of the mystery shopper survey, but we believe this may be an overestimate due to the similarity in appearance of incandescents and EISA-compliant halogens.

The stocking of specialty bulbs, which is not impacted by EISA, is different from that of standard products. Incandescents and halogens comprised a slight majority (51%) of specialty products stocked in stores. Incandescents were the most common specialty product making up over one-third (35%) of the products on retailers' shelves and CFLs were next most common comprising over a quarter (28%) of the products.

Across all retailers where we conducted customer interviews, almost two-thirds of customers purchased at least one energy efficient bulb (64%). Approximately half of customers purchased program-discounted CFLs (56%) while a very small percentage (3%) purchased CFLs that were not discounted by the AIC program. LEDs do not yet have a large market share; only 5% of customers purchased LEDs. A sizable percentage of customers still purchased a less efficient bulb—either incandescents (29%) or EISA compliant halogens (12%).

The type of bulbs purchased varies depending on whether the customer is purchasing a standard versus specialty bulb. When purchasing a specialty bulb, nearly two-thirds of customers purchased incandescents or halogens (65%) compared to one-quarter of customers when purchasing standard bulbs (25%).

Some retailers only stock CFLs and LEDs. If we exclude those retailers from the analysis, we find that a sizable percentage of bulbs purchased were less efficient products, even in the presence of program discounts. Thirty-nine percent of standard bulbs purchased were a less efficient bulb while 70% of specialty bulbs purchased were less efficient.

Results from our in-home lighting audit confirm these findings. Overall CFL saturation increased from 33% in 2012 to 38% in 2014. This increase is due entirely to an increase in CFL saturation in standard light sockets. CFL saturation in standard sockets increased from 40% in 2012 to 49% in 2014 but remained essentially the same in specialty sockets (18% in 2012 compared 16% in 2014 – a change that is not statistically significant).

The consumer preference study provides further evidence that AIC customers are willing to purchase standard CFLs at wide range of price points but not specialty CFLs. Even at higher price points, customers prefer standard CFLs to incandescents, halogens, and LEDs. LEDs are not a substitute for standard CFLs at current market prices for LEDs. Even at less than \$3 a bulb for an LED, customers prefer CFLs.

The results are quite different for specialty CFLs. Customers are only willing to purchase specialty CFLs at low price points. Customers are far more discriminating when it comes to specialty bulb purchases and prefer less efficient technologies. However, specialty LEDs may be an effective substitute. Our results show that as the price for specialty LEDs decreases, the market share of specialty CFLs steadily declines while the share for halogens and incandescents remains relatively flat.

We looked closely at the consumer preferences of customers with below median CFL saturation to better understand what the program could do to encourage these customers to purchase more efficient lighting. These customers tend to be older and have a higher percentage of specialty sockets in their homes. We found that lower prices on CFLs are unlikely to cause them to purchase CFLs, but they are not averse to efficient lighting. Reduced pricing on LEDs, particularly specialty products, could increase the efficiency of lighting in their homes.

3.2 Residential Behavioral Modification

Ameren Illinois Company (AIC) administers the Behavioral Modification Program as a part of its residential portfolio. AIC developed the program to reduce its residential customers’ energy consumption. Launched in August 2010, the program seeks to:

- Reduce energy consumption by encouraging energy-efficient behaviors.
- Boost customer engagement and education by helping customers understand energy efficiency and how to save energy in their homes.
- Educate customers about no-cost and low-cost energy-saving measures and behaviors.

The program offers three treatment types: a hard copy home energy report (HER) mailed to the customer’s home, an electronic copy of the same report emailed to the customer, and an online portal that customers can access to view the same report along with additional information.

The Behavioral Modification Program reached almost one-third of AIC’s 1 million residential customers in PY6. Most of the approximately 224,000 participants are in their third year with the program, although about 26,000 residential customers participated for the first time in PY6 (see Table 7).

Results

In PY6, the program achieved adjusted net savings of 41,051 MWh and 1,809,293 therms (Table 7). Adjusted net savings remove the energy savings that resulted from customer participation in other AIC programs in PY6.

Table 7. PY6 Behavioral Modification Program Impacts

Cohort Name	Adjusted Net Savings (% per HH)	Adjusted Net Savings (per HH)	Number of Customers Treated in PY6	Adjusted Net Program Savings
Energy Savings (MWh)				
Original Cohort	1.80%	220.59	41,757	9,211
Expansion Cohort 1	1.98%	267.27	63,521	16,977
Expansion Cohort 2	1.17%	107.53	84,035	9,037
Expansion Cohort 4	1.33%	222.85	26,147	5,827
Total MWh*	NA	186.30	215,460	41,051
Gas Savings (Therms)				
Original Cohort	0.88%	9.10	41,787	380,349
Expansion Cohort 1	1.09%	12.47	63,232	788,552
Expansion Cohort 2	0.70%	5.44	82,043	446,039

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Cohort Name	Adjusted Net Savings (% per HH)	Adjusted Net Savings (per HH)	Number of Customers Treated in PY6	Adjusted Net Program Savings
Expansion Cohort 3	1.10%	10.07	10,672	107,441
Expansion Cohort 4	0.36%	3.26	26,696	86,912
Total Therms*	NA	7.99	224,430	1,809,293

* Note: Total may not equal due to rounding.

The AIC Behavioral Modification program is achieving its stated goals to reduce energy consumption, boost customer engagement and education, and educate customers about energy savings measures and behaviors. We outline these achievements below.

- The program reduced energy consumption by encouraging energy-efficient behaviors. Billing analyses indicate a reduction of 41,051 MWh and 1,809,293 therms.
- The program educated customers about no-cost and low-cost energy-saving measures and behaviors.
 - *Customers who engage in no-cost energy-saving behaviors are more likely to purchase equipment to achieve energy savings.* Program participants who engage in no-cost energy efficient behaviors (such as turning off lights when not in a room) are more likely to make low-cost energy efficiency purchases (such as buying CFLs) after receiving their HER. AIC should continue sending HERs to encourage customers to make low-cost (and high-cost) energy efficient purchases.
 - *The analysis of the survey results shows that participants have significantly higher levels of knowledge on ways to save energy and are adopting more low-cost and no-cost measures and behaviors than AIC customers who are not exposed to this program.*
- The program boosted customer engagement and education by helping customers understand energy efficiency and how to save energy in their homes.
 - The analysis of the survey results shows that participants are significantly more engaged with and more aware of their home’s energy use than AIC customers who are not exposed to this program. The survey shows that the HER is raising customers’ awareness of their home energy consumption. Program participants are more likely to have read their utility bills to understand their home energy usage, discussed their home’s energy usage, learned about new ways to save energy in their homes, and researched specific actions, equipment, or technologies to help save energy at home.
 - The program motivates participants to participate in other residential AIC programs. All but one treatment cohort had a higher rate of participation in other residential AIC programs during PY6 than did the control cohorts. While the percentage increases are small, the overall effect is substantial given the large number of customers in the treatment cohorts. In addition, survey results show that program participants are more satisfied with the types of energy efficiency programs offered by AIC than the control group. Notably, the channeling analysis shows that while the number of customers participating in other programs is nearly the same in the participant and control groups, the level of participation in those other programs is higher among the participants in the Behavioral Modification Program. However, our historical channeling analysis, which analyzes program participation overtime, indicates that participation rates for treatment and control groups appear to converge after the first year of participation.

- Consistent with prior evaluations, specific types of customers tend to have different percentage savings. Survey findings reveal the types of participants who take purchase actions.
- Similar to previous evaluations of the program, per-household percent savings tend to increase with the level of baseline consumption. The evaluation team compared customer savings by baseline usage and found that as baseline consumption increases, the per-household percentage savings also tends to increase.
- Similar to previous evaluations of the program, per-household percentage savings tend to differ by fuel type and season. The evaluation team compared customer savings by season and found that the dual fuel cohorts tended to have slightly higher electric savings during the summer, while gas savings tended to be slightly higher during the winter when the majority of residential gas consumption occurs.
- Survey results show that past purchase behaviors could dictate future energy-saving actions. Findings from two analyses show that actions taken are not different across participants and the control group. Respondents (regardless of treatment or control group) who took high-cost actions (such as installing an HVAC system) before the HER program are more likely to make energy efficient purchases (both high-cost such as weatherization and low-cost such as AC tune-ups) during the program period. Participant actions may be driven as much by participant orientation as by the home energy report; however, additional research is needed to confirm this hypothesis.

3.3 Residential HVAC

In Program Year 6 (PY6), the Ameren Illinois Company (AIC) Residential Heating and Cooling Program (HVAC Program) offered customer incentives for purchases of high-efficiency furnaces, brushless/electronically commutated motors (ECMs), boilers, air-source heat pumps (ASHPs), ground-source heat pumps (GSHPs), and central air conditioners (CACs). All equipment requires installation by an AIC HVAC-registered program ally. Incentive levels varied according to equipment types and baseline efficiency levels. AIC offered the same incentive levels as those offered in PY5 to maintain consistency across the 2 years. Conservation Services Group (CSG) implemented the HVAC Program for AIC in PY6.

AIC expected this program to produce 7% of the overall PY6 portfolio's electric savings and 30% of the overall PY6 portfolio's therm savings. According to the AIC HVAC program manager and evaluation results, the program exceeded its PY6 MWh savings goals of 4,978 MWh by about 47% and its demand and gas savings goals of 2.6 MW and 712,610 therms by about 70%.

To support this study, the evaluation team conducted the following:

- AIC and implementer program manager interviews
- A participant customer survey
- A customer choice survey for investigating the optimal mix of incentive amounts and seasonal energy-efficiency ratio (SEER) levels to encourage customer participation
- Distributor interviews to explore how the program affected local business
- An active registered (AR) contractor survey
- A savings analysis based on a review of the tracking data

Portfolio Results

- Free-ridership and spillover analysis based on the customer survey
- A database analysis of SEER vs. free-rider trends over the last 4 years (includes only PY3, PY4, and PY6)

Impact Results

The evaluation team’s assessment of the HVAC Program indicated that program tracking accurately captured the number of program participants and program-installed measures. Detailed tracking information in the database included information on unit types, sizes, efficiencies, and measure installation locations. These served as inputs to savings algorithms in the Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 2.0 (June 7, 2013).

The evaluation team reported ex ante savings by summing results from the tracking database and calculated ex post savings for every installed measure in accordance with the IL-TRM Version 2.0.

Through telephone interviews with participating customers, the evaluation team verified participation, equipment purchased, and efficiency levels reported in the database. One respondent (approximately 0.5% of the sample) reported that he had purchased a SEER 14.5–14.9 air conditioner, while the tracking database indicated that the customer purchased an ECM. This revision slightly affected the verification rates shown in Table 8. We also verified that measures identified as early replacement (ER) met the maximum SEER and annual fuel utilization efficiency (AFUE) criteria specified in the IL-TRM Version 2.0.

Table 8. Summary of PY6 Verification Results

Measure	Participation	Surveyed Participants	Verified Participants	Verification Rate
Electric Measures				
CAC/ASHP ER < 16	2,405	40	40	100%
CAC/ASHP ER 16+	1,976	44	44	100%
CAC/ASHP RB* < 16	1,026	44	45	102%
CAC/ASHP RB 16+	1,140	40	40	100%
ECM	4,149	36	35	97%
GSHP	219	N/A	N/A	100%
Subtotal	10,915	204	204	
Gas Measures				
Gas Furnace ER	4,124	N/A	N/A	100%
Gas Boiler ER	2,062	N/A	N/A	100%
Gas Furnace RB	4,124	N/A	N/A	100%
Gas Boiler RB	2,062	N/A	N/A	100%
Subtotal	12,372			
Total	23,287	204	204	100%

* Replaced on burnout.

Table 9 provides ex ante and ex post per-unit savings by measure type.

Table 9. Summary of Database Analysis Results

Measure	Ex Ante Annual Per-Unit Gross Savings			Ex Post Annual Per-Unit Gross Savings			Per-Unit Annual Gross Realization Rate*		
	kW	kWh	Therms	kW	kWh	Therms	kW	kWh	Therms
CAC	0.303	307	-	0.298	333	-	98.4%	108.4%	-
CAC ER	1.261	1,259	-	1.311	1,304	-	103.9%	103.6%	-
ASHP	0.370	1,523	-	0.273	1,286	-	73.8%	84.5%	-
ASHP ER	1.271	6,395	-	1.281	5,529	-	100.8%	86.5%	-
GSHP	0.596	3,828	-	1.048	5,319	-	176.0%	139.0%	-
ECM	0.302	710	-	0.288	715	-	95.3%	100.7%	-
Gas Furnace	-	-	138	-	-	134	-	-	97.1%
Gas Furnace ER	-	-	347	-	-	357	-	-	103.1%
Gas Boiler	-	-	162	-	-	174	-	-	107.6%
Gas Boiler ER	-	-	588	-	-	579	-	-	98.5%

* Gross realization rate = ex post gross savings ÷ ex ante gross savings. The evaluation team calculated the realization rate before rounding ex post and ex ante values.

Ex post per-unit savings fell within 10% of ex ante estimates for most measures, with the differences mainly resulting from differences in the installed efficiency value used to calculate ex ante and ex post savings for each rebated measure. Specifically, AIC used the same efficiency value, the minimum value, to determine ex ante savings for all rebated measures from each efficiency category (e.g., gas furnace ≥ 97% AFUE), while the evaluation team estimated ex post savings using TRM algorithms and the actual efficiency values for each rebated measure as reported in the program-tracking database. For example, incentivized furnaces in the ≥ 97% AFUE furnace category could install higher-efficiency units than the minimum 97 AFUE requirement, yielding higher savings in the ex post calculations. The TRM algorithms require measure-specific input values for system efficiency, system size, and climate zone. ASHP realization rates fell below 100% due to the actual mix of locations, size, and efficiencies yielding different savings than the assumed ex ante value.

The net-to-gross ratio (NTGR) framework provided in the Illinois Commerce Commission (ICC) Order for Docket 10-0568 stipulates a deemed NTGR value derived from PY3 evaluation results for all electric and gas measures offered through the program: 0.59 for electric measures (e.g., ASHPs, CACs, ECMs, and GSHPs), 0.77 for gas furnaces, and 0.79 for gas boilers (including spillover). Consistent with the calculation of ex ante net savings, the evaluation team used these values to calculate ex post net savings.

Table 10 shows PY6 program net savings impacts.

Table 10. PY6 HVAC Program Impacts

Measure	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
CACs/ASHPs	8,396	.98	8,241	0.59	4,862
ECM Fans	2,946	1.01	2,967	0.59	1,750
GSHPs	838	1.39	1,165	0.59	687
Total MWh	12,180	1.02	12,373	0.59	7,299

Measure	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Demand Savings MW					
CACs/ASHPs	6.41	.96	6.17	0.59	3.64
ECM Fans	1.25	.95	1.20	0.59	0.71
GSHPs	0.13	1.76	0.23	0.59	0.14
Total MW	7.79	0.97	7.59	0.59	4.48
Gas Savings Therms					
Gas Furnaces	1,501,711	1.00	1,504,010	0.77	1,158,088
Gas Boilers	37,017	1.00	36,886	0.79	28,858
Total Therms	1,538,728	1.00	1,540,896	0.77	1,186,946

Process Results

Based on the evaluation tasks, the evaluation team determined that AIC and CSG implemented the HVAC Program effectively. Participation and evaluated savings exceeded their targets, which surpassed those achieved in PY5. Customer and contractor satisfaction with the program was high. While the program achieved its goals, it could probably continue to increase participation by:

- Increasing outreach to and actively coordinating with distributors
- Offering more convenient training to both active and non-active contractors
- Minimizing design changes
- Increasing incentives for SEER 16 and above equipment

Opportunities exist for CSG to improve verification procedures, trade ally outreach, and training and reporting activities.

During PY6, AIC exceeded its program goals for gas and electric measure savings and for processed applications. AIC and CSG program managers attributed many of these achievements to contractors being more familiar with the program, as neither equipment nor incentive levels changed from PY5 to PY6. In PY5, contractors had expressed dissatisfaction with the number of program changes from PY4.

The evaluation team’s analysis of customer cooling choices under different incentive and efficiency scenarios indicated that revising some incentive offerings might improve participation or lower program costs.

Conclusions and Recommendations

The evaluation team offers a summary of our recommendations for AIC’s consideration. (We present a comprehensive list of conclusions and recommendations in Section 4.4.)

- **Recommendation 1:** When introducing PY7 design changes, AIC should update all materials and remove or take down old materials and website information. Through CSG/Leidos, AIC should aggressively reach out to contractors and distributors to communicate program changes clearly and to provide a contact point for these stakeholders to ask questions or obtain more information.

- **Recommendation 2:** AIC/CSG should consider joint meetings, outreach activities, and training with both distributors and contractors to ensure consistent presentation of program messaging, requirements, and offerings; allow for cross-fertilization of ideas and networking; and distribute updated program documentation and training schedules.
- **Recommendation 3:** CSG/Leidos should increase the number of training offerings, presented in a greater number of locations; provide sufficient advance notice; or adopt a regular schedule that does not change each year.
- **Recommendation 4:** CSG/Leidos should hire a second regional account representative as planned (filling the open position) to ensure that CSG can effectively cover the north and south AIC service territories in terms of supporting distributors and contractors.
- **Recommendation 5:** CSG may want to develop case studies or collect testimonials to include in marketing materials or contractor training.
- **Recommendation 6:** CSG should develop strategies for retaining registered contractors and for recruiting new contractors. It may prove beneficial to refresh marketing materials, perhaps with the input of distributors, making the materials more attractive to contractors. AIC and CSG may wish to explore co-marketing with contractors and consider marketing to smaller firms, which are more present in the non-active (those that have signed up but not actually participated) than the active registered contractor group.
- **Recommendation 7:** Because ER equipment drives higher savings, AIC and CSG should develop a simple tracking report that collects information needed to monitor ER vs. RB trends and other program indicators that track where AIC achieves higher savings. This could take the form of a dashboard that CSG updates monthly.
- **Recommendation 8:** If cost-effectiveness and budget allow, consider eliminating the lowest SEER incentives and increasing the higher SEER incentives.
- **Recommendation 9:** AIC should continue to improve verification, quality assurance/quality control (QA/QC) protocols, data collection, and tracking, and should be encouraged to implement the remaining recommendations from last year's evaluation.
- **Recommendation 10:** CSG/Leidos (formerly SAIC) and AIC should expand outreach to distributors and develop new ways to engage them.
- **Recommendation 11:** AIC and CSG/Leidos should continue to improve materials, ensure consistency in messaging, remove old materials where possible (e.g., old website information), and provide distributors and other trade allies with new materials to hand out to contractors.
- **Recommendation 12:** Through training, AIC and CSG/Leidos should reinforce that field teams distribute marketing materials to trade allies with guidance on how to promote the measures using these materials.

3.4 Residential Energy-Efficiency Products

Ameren Illinois Company's (AIC) Residential Energy-Efficient Products (REEP) Program exceeded its electric and gas energy-savings goals for Program Year (PY) 6, which ran from June 1, 2013 to May 31, 2014. Conservation Services Group (CSG), Applied Proactive Technologies (APT), and Energy Federation Incorporated

Portfolio Results

(EFI) implemented the program. Through retailers in AIC’s service territory, the REEP Program offered customers rebates for the following types of efficient products:

- Programmable thermostats
- Heat pumps or efficient gas water heaters
- Air purifiers
- Smart power strips

Throughout PY6, program staff and participating retailers placed rebate applications on or near program-eligible products, and APT staff provided training to retail employees on the program and eligible products and on methods for effectively stocking products and speaking with interested customers. Participating customers mailed completed applications to EFI. Customers could also download rebate applications from the ActOnEnergy website.

Impact Results

Table 11 outlines the number of measures rebated through the program in PY6, the share of rebated measures installed and operating as intended (verification rate), and the number of verified measure installations by measure type.⁶ Customer research conducted in PY4 revealed that a significant percentage of participants do not use programmable thermostats or smart power strips as intended and thus do not generate energy savings, which accounted for the lower verification rates. We calculated PY6 ex post savings using the number of verified measure installations.

Table 11. Summary of PY6 Program Verification Results

Measure	Number of Measures in Tracking Database**	Verification Rate (PY4)	Verified Measure Installations
Programmable Thermostat*	5,599	56%***	3,135
Air Purifier	1,212	100%	1,212
Smart Power Strip	857	46%	394
0.67 Water Heater	417	100%	417
Heat Pump Water Heater	115	100%	115
0.70 Water Heater	75	100%	75

* The table shows the actual number of thermostats, as all duplicate thermostats for participants that are both electric and gas customers have been removed.

** Number of rebated measures.

*** Despite a 53% verification rate in PY4, the Technical Reference Manual specifies applying a 56% in-service rate to calculate thermostat savings. Therefore, 56% is used in this table.

Table 12 shows PY6 program ex ante and ex post net impacts. The tracking database provided ex ante gross estimates, which the evaluation team did not adjust. We applied the net-to-gross ratio (NTGR) in Table 2 to the ex post gross savings to calculate ex post net savings.

⁶ Measure verification rates were derived from the PY4 survey of program participants.

Table 12. PY6 REEP Program Impacts

Measure	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
Programmable Thermostat AC and Gas Heat	104	0.79	82	0.86	71
Programmable Thermostat Electric Heat	649	0.76	490	0.86	422
Heat Pump Water Heater	265	1.02	269	0.86	231
Air Purifier	665	1.02	681	0.78	532
Smart Power Strip	31	0.71	22	0.86	19
Total MWh	1,714	0.90	1,545	0.82	1,274
Demand Savings MW					
Programmable Thermostat AC and Gas Heat	0.000	0.000	0.000	0.86	0.000
Programmable Thermostat Electric Heat	0.000	0.000	0.000	0.86	0.000
Heat Pump Water Heater	0.013	1.02	0.013	0.86	0.011
Air Purifier	0.076	1.02	0.078	0.78	0.061
Smart Power Strip	0.004	0.71	0.003	0.86	0.002
Total MW	0.092	1.01	0.093	0.79	0.074
Gas Savings Therms					
Programmable Thermostat AC and Gas Heat	127,351	0.76	96,896	0.90	87,207
0.67 Water Heater	9,708	1.05	10,210	0.90	9,189
0.70 Water Heater	2,264	0.89	2,005	0.90	1,804
Total Therms	139,323	0.78	109,111	0.90	98,200

* Ex ante results calculated using values assumed by the program implementer.

**** Net realization rate = ex post net savings ÷ ex ante net savings. Results may differ due to rounding.

Net realization rates varied significantly across measures, mostly due to the following discrepancies:

- Ex ante savings that are based on an assumed product size and efficiency, while ex post savings take into account actual product sizes and efficiency levels
- A different distribution of participant home locations than assumed (affecting weather-dependent measure gross impacts)

Process Results

Based on information gleaned from interviews with the program manager and program implementers, the program worked as intended in PY6:

- AIC, CSG, APT, and EFI effectively collaborated to successfully administer and deliver the program to participating customers.
- The program manager and implementers did not identify any major challenges or participation barriers (other than a lack of customer understanding regarding smart power strips).

- Program marketing, primarily point-of-purchase materials and rebate applications, generated sufficient program awareness.
- The program exceeded overall energy electric and gas savings goals.

However, the evaluation team did identify some issues in the tracking database in conducting our evaluation, including incomplete equipment details, inconsistencies between different worksheets in the database, and a lack of detail regarding ex ante savings calculations.

According to interviews with program stakeholders, the REEP program is designed to transform the market for qualifying measures, creating availability and consumer demand for energy-efficient models. Since AIC suspended this program after PY6, ongoing monitoring should assess the degree to which markets have been transformed. AIC could consider collaborating with previously participating retail stores, many of which participate in the Upstream Lighting Program, and ask them to track whether sales of these products continue at current levels or drop after the program's end. The information could prove useful for estimating future spillover from AIC's portfolio.

Conclusions and Recommendations

Though AIC will not offer the REEP Program in PY7, the evaluation team offers the following recommendations for AIC's consideration as they may be applicable to other programs:

- **Consider consolidating the four-part tracking database into two parts.** The application data table and the savings table should be combined into one database for each program type (electric and gas). The evaluation team's review found quantity discrepancies between the two worksheets in the tracking database. Consolidating the tables would provide quality assurance by eliminating possible discrepancies in tracking data.
- **Complete specification tracking for all equipment model numbers.** The program thoroughly tracked the make and model number of all appliances, but incompletely tracked equipment details and specifications used for sizing and as inputs to savings calculations. Section 4.3.1 details the evaluation requirements missing from the database for PY6.
- **Include detailed calculations and assumptions for ex ante per-unit energy and demand savings.** For a more accurate impact analysis, the evaluation team should better understand the implementer's methodology for claimed savings.
- **Create an online database that program managers or evaluation staff could access to obtain program updates as needed** (and as noted in previous evaluations across AIC's residential portfolio). AIC staff would like more frequent reports and copies of the database during program implementation.
- **Consider leveraging existing marketing opportunities**, such as general program marketing materials, in-store promotional activities for the Upstream Lighting Program, and AIC's presence at state fairs. This would continue to educate consumers about the benefits of energy-efficient products, especially smart power strips, thus serving to further the market transformation goal shared by all AIC programs and creating spillover for AIC's energy-efficiency portfolio.

3.5 Residential Appliance Recycling

The Ameren Illinois Company (AIC) Appliance Recycling Program (ARP) offers free recycling of refrigerators, freezers, and room air conditioners for residential and small commercial customers. The program is in its sixth

year of operation. AIC expected ARP to achieve approximately 7% of the electric savings of AIC’s overall portfolio. Conservation Services Group (CSG) manages the program and its advertising. Appliance Recycling Centers of America (ARCA) implements the program, including picking up and recycling appliances, as well as providing scheduling and customer service.

To verify program participation and to estimate Program Year 6 (PY6) savings, the evaluation team reviewed and analyzed the tracking database. The evaluation team calculated savings estimates using the regression equation specified in the Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 2.0 (June 7, 2013). The evaluation team applied net-to-gross ratio (NTGR) adjustments prospectively based on PY4 evaluation activities and estimated a new NTGR using a PY6 participant survey to inform future year evaluations.

For the process review, the evaluation team interviewed program managers from AIC, CSG, and ARCA, and gathered results from recent evaluations to benchmark several program metrics.

Impact Results

As shown in Table 13, the team verified participation by conducting surveys with a sample of 140 participants who recycled refrigerators and freezers in PY6. Because there were only 17 air conditioners recycled through the program in PY6 (accounting for only 0.2% of the total number of appliances), the evaluation team applied the PY4 verification rate of 100% for air conditioners.

Table 13. Summary of Participant Verification Results

Recycling Measure	Participants	Sample	Verified Sample	Verified Participants	Verification Rate
Refrigerator	7,079	70	70	7,079	100%
Freezer	2,181	70	70	2,181	100%
Air Conditioner	17	N/A*	N/A	17	100%
Total	9,277	140	140	9,277	100%

* Applying PY4 verification rate for air conditioners.

In 2012, the IL-TRM Version 2.0 introduced a change in the methodology for estimating annual consumption of recycled refrigerators and freezers, based on an *in situ* metering study conducted for a similar Commonwealth Edison (ComEd) program. The IL-TRM Version 2.0’s algorithm relied on inputs from a program-tracking database and from a participant survey. Though gross per-unit savings decreased between PY4 and PY5 due to the changed algorithm, gross per-unit savings increased between PY5 and PY6, rising 15% for refrigerators and 18% for freezers. This is likely due to changing appliance characteristics (such as an increase in primary units from 34% in PY4 to 67% in PY6). Primary units have more utilization, which results in higher use than secondary units.

The evaluation team also used the participant survey input to calculate an updated part-use factor (the percentage of time a product remains plugged in), which will be applied in future evaluations. For PY6 impact calculations, the evaluation team applied the part-use factor specified in the IL-TRM Version 2.0.

Table 14 shows total gross and net impacts for PY6 and the net realization rates.

Table 14. PY6 ARP Impacts

Component	Ex Ante Gross*	Realization Rate	Ex Post Gross	NTGR	Ex Post Net**
Energy Savings MWh					
Refrigerator	5,720	1.12	6,424	0.63	4,041
Freezer	1,972	1.03	2,038	0.63	1,282
Air Conditioner	4	0.75	3	1.00	3
Total MWh	7,696	1.10	8,466		5,326
Demand Savings MW					
Refrigerator	0.71	0.96	0.68	0.63	0.43
Freezer	0.23	1.00	0.23	0.63	0.14
Air Conditioner	-	n/a	0.00	1.00	0.00
Total MW	0.94	0.97	0.91		0.57

* Ex ante estimates were provided in the tracking database, which were based on the PY4 results included in the IL-TRM Version 2.0. Air conditioner ex ante savings are based on PY5 results, as there were no reported savings included in the tracking database.

** Ex post determined by applying NTGR and verified participation.

To estimate PY6 net savings, the evaluation team applied the PY4 NTGR of 0.63 for refrigerators and freezers and 1.0 for air conditioners. It is likely that ex ante per-unit gross savings estimates were lower than ex post gross savings because of a difference in the mix of units recycled compared to that assumed for tracking purposes.⁷ The evaluation team found ex post net per-unit savings to be greater than the ex ante net per-unit savings. Together, these resulted in an overall net realization rate of 125%.

Process Results

While AIC exceeded its internal program savings goal of 4,405 MWh of net savings for the year, participation decreased by 21% from PY5, falling from 11,679 to 9,277 appliances. The trend in decreasing participation continued from the program’s peak year of PY4. This is not uncommon: Appliance recycling programs typically experience declining participation as they remove the pool of unused or unnecessary secondary refrigerators and freezers from the market. Additionally, AIC’s service territory experienced a particularly severe winter, which likely also affected participation due to difficult road conditions for the drivers picking up the appliances.

In addition, CSG transferred some marketing responsibilities to ARCA and that caused some delays getting bill inserts out during the first half of PY6, which is a typically busy time for the program. The issues were resolved early in 2014, and the unspent portion of the marketing budget was used to boost marketing efforts in the second half of the program year. However, the lack of bill inserts in 2013 likely contributed to lower participation as well.

⁷ The implementation applied the default value in the IL-TRM Version 2.0 to an assumed mix of units recycled based on PY4 data.

Much of the same types of program marketing took place in PY6 as in prior years. AIC continued its retail partnership with Sears; its nonprofit referral bonus of \$10, whereby a nonprofit, named by a participant as a referral entity, received payment in addition to incentives paid to the customer; and its use of the Energy Hog as the program's mascot. AIC also repeated a spring sweepstakes for a \$2,000 ENERGY STAR® appliance shopping spree, with anyone recycling an appliance during January through March entered for the prize. These marketing efforts took place in addition to more customary marketing, such as bill inserts, e-mail blasts, print ads, and online ads.

Through a benchmarking task, the evaluation team found that AIC's program is comparable to others in its participation trends and NTGR results.

Conclusions and Recommendations

- **Conclusion 1:** Given historical trends, it appears unlikely that AIC will be able to significantly increase participation in the ARP without significant effort. This is because once the really old units are removed from the grid, only a small percentage of appliances turn over each year. If the program implemented a more aggressive marketing effort, the marginal acquisition cost of additional units would likely be substantially higher than that of historical participants. AIC has already introduced the changes most likely to significantly increase participation: changing eligibility to include primary appliances and increasing the incentive. The percentage of participants hearing about the program through word of mouth is significant.
- **Recommendation 1:** AIC could consider targeted marketing to maintain current participation levels. Marketing targeted to households with long-term active accounts could potentially identify homes with units older, on average, than other program units. Older units produce higher-than-average savings, especially if manufactured prior to the appliance efficiency standards of the early 1990s. Other programs implementing this approach saw an increase in the average appliance age and associated savings.
- **Conclusion 2:** In most program metrics, AIC greatly resembles other appliance recycling programs operating nationally, including NTGR, eligibility, incentive levels, and participation. AIC operates slightly below average in per-unit energy savings for appliances recycled through the program. AIC's per-unit savings, however, remain close to Consumers Energy in Michigan, the program most readily comparable by geography and tenure.
- **Recommendation 2:** To increase per-home savings, AIC could consider novel program designs to possibly increase per-unit savings for each participant. Energy-saver tips and a low-cost measure (such as a couple of CFLs or an LED) could be left behind with customers, thus adding relatively cheap incremental savings to the program.
- **Conclusion 3:** The percentage of customers hearing about the ARP through word of mouth is significant (23%) likely due to AIC's combined marketing efforts.
- **Recommendation 3:** Consider building and expanding this component by offering a referral incentive or simply requesting participants to refer others to the program.

3.6 Residential Multifamily

In Program Year 6 (PY6) (June 1, 2013, through May 31, 2014), AIC expected the Multifamily Program to account for 2% of the overall portfolio electric savings and 6% of the overall portfolio therm savings.⁸ In addition, this program was part of the Illinois Power Agency (IPA)/8-103 expansion.

Implemented by Conservation Services Group (CSG), savings from the program came from a combination of three components: Common Area Lighting, Major Measures, and In-Unit, which provided a variety of energy efficiency measures, including air sealing and insulation, CFLs, faucet aerators, and showerheads. Eligible customers could participate in any combination of the program components.

The PY6 evaluation of the Multifamily Program involved both impact and process assessments. In particular, to support the evaluation, the evaluation team conducted a review of program materials and program-tracking data and interviewed program administrators and implementation staff. Our quantitative research efforts included a survey of participating property managers, as well as their tenants.

Below we present the key findings from the PY6 evaluation.

Impact Results

Overall, the PY6 Multifamily Program performed well against its internal targets, achieving 9,075 MWh in net electric savings and 100,143 therms in net gas savings. In addition, the net realization rates were generally high.

Table 15. PY6 Multifamily Program Net Impacts

Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
In-Unit	7,550	0.99	7,487	1.00	7,487
Common Area Lighting	708	1.04	738	0.80	591
Major Measures	1,025	1.04	1,061	0.94	998
Total MWh	9,284	1.00	9,286		9,075
Demand Savings MW					
In-Unit	0.58	1.03	0.60	1.00	0.60
Common Area Lighting	0.10	0.98	0.10	0.80	0.08
Major Measures	0.28	1.13	0.32	0.94	0.30
Total MW	0.96	1.05	1.01		0.98
Gas Savings Therms					
In-Unit	98,905	0.99	97,457	1.00	97,457
Common Area Lighting	n/a	n/a	n/a	n/a	--
Major Measures	4,409	0.76	3,358	0.80	2,687

⁸ Planned portfolio-level savings estimates are based on the AIC Plan 2 filing (September 20, 2011).

Portfolio Results

Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Total Therms	103,314	0.98	100,815		100,143

The PY6 impact results are based on the application of the Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 2.0 (June 7, 2013), as well as deemed net-to-gross ratios (NTGRs) from PY2 (In-Unit and Common Area) and PY5 (Major Measures) to determine net savings. Outside of gross savings adjustments, the difference between ex ante and ex post net impacts result from differences in the NTGR used by the implementation and evaluation teams for major measures and common area lighting. In particular, the implementation team applied a NTGR of 0.93 for attic insulation measures and a 1.0 for air sealing measures to estimate ex ante net savings, while the evaluation team used a NTGR of 0.94 for electric savings and 0.80 for gas savings to estimate ex post savings as specified for major measures in the evaluation plan.⁹ Further, implementation team applied a NTGR of 1.0 for all common area lighting measures to estimate ex ante net savings, whereas the evaluation team applied a NTGR of 0.80 to energy and demand gross savings to estimate ex post net savings for the same measures.

Process Results

The Multifamily Program performed very well in PY6 in terms of both savings achieved¹⁰ and participant satisfaction. Furthermore, participation in the In-Unit and Common Area Lighting components continued to grow, whereas participation in the Major Measures component was lower than in prior years due to a shortened implementation period of only 3 months.¹¹ Cross-component participation increased in comparison to PY4, when the evaluation team last conducted this analysis. In particular, 56 property managers (26%) participated in more than one program component in comparison to only 6 (3%) in PY4. Overall, lack of awareness of the Common Area Lighting and Major Measures components was the main barrier to cross-participation.

AIC and the implementation team made several changes in program design and implementation during PY6. In January 2014, the program introduced specialty bulbs to address a customer need to retrofit incandescent globes, reflectors, and candelabra base bulbs with florescent lamps. The program also collaborated with AIC's Property Management Group to improve program marketing, and implemented a new inventory design and logistics strategy including the hiring of a new Field Manager to increase Technical Field Representatives' install production rate and overall program savings.

Conclusions and Recommendations

Based on the evaluation team's PY6 evaluation activities, we make the following recommendations for the program going forward.

⁹ These NTGRs came from the PY5 evaluation and were not available to the implementation team at the beginning of PY6.

¹⁰ As per the Monthly Portfolio Report from May 2014, the Multifamily Program achieved 129% of electric savings and 309% of gas savings (ex ante estimates of net savings compared to internal goals for the program).

¹¹ The program reintroduced the Major Measures program component in March 2014 to offer incentives for air sealing and attic and wall insulation, as well as programmable thermostats.

- **Consider the development of leave-behind marketing materials to educate participants about other program components.** The property manager survey identified a lack of awareness of the Common Area Lighting and Major Measures components among property managers who received In-Unit upgrades through the program. As a result, the program should develop new strategies for educating property managers about other program components in order to encourage cross-component participation. In particular, current onsite interactions with customers as part of their participation in other program components provide a potential opportunity to share additional program information. While it may not be feasible to create new marketing collateral within the program budget, program staff should consider whether they could invest in communicating with property manager participants in this way in future program years.
- **Make changes to the data tracking process.** The outcome of the PY6 impact evaluation led the evaluation team to make a number of recommendations related to the data tracked by CSG. These recommendations include:
 - Track kW-controlled values based on the type of occupancy sensor installed by the program.
 - Track whether exit signs replaced by program measures are fluorescent or incandescent.
 - Track the building number separately from the postal address to aid in the verification of addresses in future survey efforts.
 - Explore, and, if feasible, resolve discrepancies between the fuel type listed in the “Incentive Application” data tab and the data tabs that provide more detailed information on measures for electric customers (MF_Electric) and gas customers (MF_Gas).

3.7 Home Performance with ENERGY STAR®

The Home Performance with ENERGY STAR® (HPwES) Program is a home energy diagnostic program offering audits to all AIC residential customers and retrofits to customers with AIC heating fuel. A component of HPwES, the Electric Space Heat Pilot (ESHP), focuses on older homes equipped with electric space heat.

Formerly known as Home Energy Performance (HEP) Program, the transition to an HPwES program was completed in PY6 (June 2013 to May 2014). Conservation Services Group (CSG) implements the HPwES Program. The Program offers audits, direct install measures, and incentives for additional energy efficiency opportunities.

The evaluation team conducted an impact and process evaluation of the HPwES Program in PY6. To support the process evaluation, we reviewed program materials and program-tracking data, interviewed implementation and AIC staff, and conducted telephone surveys with 238 randomly selected HPwES and ESHP participants. To estimate gross impacts, the evaluation team conducted an engineering analysis. We also conducted, for the second year in a row, a billing analysis in an effort to create adjustment factors for engineering results in the IL-TRM Version 2.0 (June 7, 2013). However, the impact results presented here are based on our engineering analysis only.

The HPwES Program reached 2,863 participants in PY6. There were also 114 ESHP participants. Because HPwES and ESHP follow similar implementation strategies, this report presents results for the HPwES program as whole (i.e., HPwES and ESHP combined), unless otherwise specified.

The HPwES program provides a small percentage of AIC’s annual energy savings. AIC expected this program to provide 1.3% of the utility’s annual electricity savings and 2.2% of its therm savings from residential and commercial customers.

Impact Results

This evaluation’s primary objective was to estimate the energy savings impacts from installing HPwES measures. To determine gross impacts, we applied the IL-TRM Version 2 savings algorithms using program-tracking database inputs. To determine net impacts, we applied the PY4 HEP Program measure-specific net-to-gross ratios (NTGRs). Table 16 shows the net impacts for the HPwES program.

Table 16. PY6 HPwES Program Impacts

Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
Total MWh	4,537	0.94	4,261	n/a	3,883
CFLs	1,135	1.05	1193	0.97	1,158
Faucet Aerators	25	1.02	26	0.86	22
Showerheads	159	0.98	156	1.05	163
Air Sealing	2,303	0.90	2,080	0.88	1,830
Insulation	913	0.89	808	0.88	711
Total MW					
Total MW	2.11	1.02	2.16	n/a	1.92
CFLs	0.12	0.98	0.12	0.97	0.12
Faucet Aerators	0.01	1.01	0.01	0.86	0.01
Showerheads	0.01	0.98	0.01	1.05	0.01
Air Sealing	1.71	1.0	1.71	0.88	1.51
Insulation	0.25	1.19	0.30	0.88	0.26
Total Therms					
Total Therms	463,638	1.09	503,875	n/a	411,594
Faucet Aerators	3,679	1.02	3,743	0.75	2,808
Showerheads	19,331	0.98	18,925	0.82	15,518
Air Sealing	245,559	1.10	270,207	0.83	224,271
Insulation	194,083	1.08	210,014	0.80	168,011

The HPwES Program achieved net realization rates above 100% for both kW and therm savings in PY6; however, the net realization rate for kWh savings was lower (95%). This variance in net realization rates can be attributed to differences in input values for ex ante and ex post savings algorithms for air sealing and insulation measures. Specifically, we report differences in values for cooling degree day (CDD), heating degree day (HDD), full load cooling hours, and baseline efficiencies for heating and cooling equipment. In addition, our ex post calculations use a different set of assumptions to estimate savings for rim joist insulation.

Process Results

The HPwES Program operated according to design, with several changes in PY6. The program finalized its transition to an HPwES program. As a result, trade allies are now required to sign up with the Midwest Energy Efficiency Alliance (MEEA), program forms now include HPwES logos and language, intake forms and incentive applications meet HPwES requirements, and measures and incentive levels now support HPwES standards.

Some minor modifications were also made to the implementation of the HPwES Program. PY6 saw greater emphasis on more comprehensive retrofits by program allies. Starting in PY5, the HPwES Program has issued gold and silver Energy Star certificates of completion for homeowners that complete major improvements (and meet certain eligibility requirements) during their upgrade. In PY6, the HPwES Program saw an increase in the number of silver and gold certificates issued to homeowners. By analyzing the program tracking databases for PY5 and PY6, the evaluation team found sizeable increases in average per household (ex ante) savings from PY5 to PY6, further evidence of a shift toward more comprehensive retrofits.

Despite relatively few changes in program design and implementation, program staff noted significant challenges in meeting savings goals. PY6 saw a significant decrease from PY5 in the total number of projects and measures installed. Program staff attributed the drop off in participation to a number of potential causes, including a decline in trade ally support of the program following struggles with the project funding reservation system employed in PY5. Program staff also noted that a particularly cold winter in 2013–2014, coupled with a rebounding economy, might have influenced more customers to participate in larger programs such as HVAC replacement.

Recommendations

The evaluation team proposes the following recommendations for the HPwES Program:

- **If possible, consider re-establishing the on-bill financing component of the HPwES Program.** In PY6, AIC discontinued the on-bill financing program due to insufficient funds. Program staff expressed concern that dropping the on-bill financing option hurt program participation and reduced trade allies' ability to market the program. Our participant survey showed significant interest in the on-bill financing option. These findings suggest that financing options could help increase conversion rates and lead to retrofits that are more comprehensive.
- **Conduct trade ally interviews in PY7 to gauge contractors' satisfaction with the program and understand the challenges they face.** Program staff noted trade ally dissatisfaction with the incentive level changes and the establishment of a reservation system in PY5. As a result, trade allies may have reduced their involvement with the HPwES Program. Our analysis shows a decrease in the number of trade ally-driven projects in PY6, which may help account for some of the drop-off in program participation. We recommend a more comprehensive process evaluation that includes a trade ally survey or trade ally interviews in order to determine whether trade allies are dissatisfied with program implementation or are diversifying their program participation.

3.8 Residential Moderate Income

Implemented by Conservation Services Group (CSG) and funded in part by the Energy Assistance Foundation (EAF)¹², the Moderate Income or Warm Neighbors Cool Friends (WNCF) Program is a home diagnostic and whole-house retrofit program that focuses on serving AIC gas and/or electric customers who do not qualify for low-income weatherization assistance, but who cannot afford to pay market prices for energy efficiency retrofit improvements to their homes. The target market is existing single-family homes heated by a fuel source (electricity or natural gas) provided by AIC and owned by customers with a household income between 200% and 300% of federal poverty level guidelines for household size.

In PY6, we conducted an impact evaluation and a limited process evaluation. To support the process evaluation, we reviewed program materials and program-tracking data and conducted interviews with implementation and program staff. To estimate gross impacts for PY6, the evaluation team conducted an engineering analysis to verify measure installations and to review program savings assumptions. Further, per the evaluation plan, we applied a net-to-gross ratio (NTGR) of 1.0 to evaluated gross savings to obtain PY6 WNCF net savings.

The expected savings from this program are less than 1.0% of the overall PY6 portfolio of electric savings and 1.4% of the overall portfolio of therm savings.¹³

Impact Results

The primary objective of this evaluation was to estimate the energy savings impacts from installing WNCF measures. For the engineering analysis, we applied the Statewide Illinois Technical Reference Manual V2.0¹⁴ (Statewide IL TRM V2.0) savings algorithms using program-tracking database inputs and applied a NTGR of 1.0 to determine PY6 net savings. Table 17 provides the net impacts for the WNCF program.

In PY6, the WNCF program achieved net realization rates above 100% for both kW and therm savings; however, the net realization rate for kWh savings was lower (95%). This variance in net realization rates can be attributed to differences in input values for ex ante and ex post savings algorithms for air sealing and insulation measures. Specifically, we report differences in values for cooling degree day (CDD), heating degree day (HDD), full load cooling hours, and baseline efficiencies for heating and cooling. Additionally, our ex post calculations use a different set of assumptions to estimate savings for rim joist insulation. We provide a detailed explanation of these differences in the gross impacts section of this report.

¹² A nonprofit organization funded through donations by AIC employees and customers.

¹³ Note that the percentage of expected savings is calculated based on the AIC Filing dated January 20, 2011.

¹⁴ State of Illinois: Energy Efficiency Technical Reference Manual v.2.0. Effective June 1, 2013.

Table 17. PY6 WNCF Program Impacts

Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Total MWh	652	0.95	617	1.00	617
Demand Savings (MW)					
Total MW	0.49	1.09	0.53	1.00	0.53
Gas Savings (Therms)					
Total Therms	162,026	1.07	173,380	1.00	173,380

Process Results

Overall, program staff implemented the WNCF program according to its design with minor changes and few challenges. The program reached 317 customers in PY6, which far surpassed its goal of 182. Although marketing efforts have not dramatically changed, program staff attribute the growth in program participation to increased word-of-mouth and contractor referrals. This has also helped drive a significant pipeline of work in the northern part of the state.

WNCF has added to its marketing efforts by creating a Warm Neighbors program page on the ActOnEnergy.com website (<http://www.actonenergy.com/for-my-home/warm-neighbors-cool-friends>). This new page is linked to AIC’s Home Performance with ENERGY STAR® (HPwES) page and allows users to download an application to participate in the WNCF program. Additionally, PY6 saw the development of WNCF instructional videos planned for use in PY7 to educate homeowners during both the pre- and post-project period. AIC proactively chose to create these videos in response to customer questions relating to the audit reports and the project installation process.

There were also some modifications to the implementation of the WNCF program. Specifically, PY6 saw a greater emphasis on more comprehensive retrofits by program allies. Starting in PY5, the WNCF program issued gold and silver ENERGY STAR certificates of completion for homeowners who completed major improvements and met certain eligibility requirements during their upgrade. In PY6, the WNCF program saw an increase in the number of both silver and gold certificates issued to homeowners. In addition, the evaluation team used program-tracking databases to calculate the average ex ante savings per program participant and found a sizeable increase in average savings from PY5 to PY6. This provides further evidence of a shift toward more comprehensive retrofits.

Program staff did not note any major implementation challenges for the PY6 program year. Since its inception, the WNCF program has operated as a small program with a limited budget. This is reflected in the marketing and outreach activities for the program, which focus primarily on word-of-mouth referrals and direct mail. However, this implementation strategy did not appear to hinder the growth of the program in any way. For the second consecutive year, the WNCF program far surpassed its participation and energy savings goals.

Recommendations

Starting in PY7, the WNCF program is set to undergo several changes, one of which may be to lower the threshold for inclusion in the program. However, as this report goes to press, the specifics of those changes have not been determined. As such, the relevance of the recommendations provided by the evaluation team will vary, depending on the nature of the changes to the program in the coming year. With this in mind, our recommendations are as follows.

- As participant numbers increase and as the program becomes a larger contributor to the portfolio, **consider conducting a second year of billing analysis as a follow-on to the PY5 billing analysis.** The PY5 evaluation found sizeable differences in the realization rates between the billing analysis and engineering analysis. A second year of billing analysis will provide additional observations and a wider range of participants from which to refine impact findings.
- **Continue with the existing marketing and implementation strategy.** The WNCF program saw significant growth in both PY5 and PY6 without making any major changes to marketing tactics or program implementation. As a result, AIC should continue with their current marketing and implementation tactics. However, if WNCF's share of portfolio savings significantly increases and/or there is a sizeable increase in program goals, the marketing and implementation strategy may warrant reconsideration.
- **Update program tracking savings assumptions to reflect the ex post values used in this evaluation.** Our engineering analysis identified several discrepancies in input values between ex ante and ex post savings calculations. To increase the accuracy of tracked savings, we recommend that WNCF adopt the ex post assumptions and savings calculations used by the evaluation team.

3.9 Residential ENERGY STAR® New Homes

The Ameren Illinois Company (AIC) ENERGY STAR® New Homes Program, implemented by Conservation Services Group (CSG), offers builders training, technical information, marketing materials, and incentives for the construction of eligible homes. Specifically, the program offers incentives for homes that meet the ENERGY STAR 3.0 or 2.5 standards or that achieve a Home Energy Rating System (HERS) index of 70 or less (a lower HERS index indicates a more efficient home) for single-family homes and 85 or less for multifamily units. Builders constructing single-family homes and duplexes heated with any fuel provided by AIC become eligible for program incentives. Builders must hire a HERS rater to verify savings achieved by energy-efficient practices. In most cases, the rater also provides technical assistance and program application processing throughout the building process.

AIC refrained from making major program design changes during Program Year 6 (PY6) (June 1, 2013–May 31, 2014) to allow program participants time to learn and adapt to the program changes implemented in PY5, including adoption of ENERGY STAR 3.0; addition of the multifamily component; entry-level, non-certified HERS-only option; and Illinois statewide adoption of the 2012 Illinois energy code. Furthermore, many communities in Illinois did not begin enforcing the revised energy code until January 2014, causing uncertainty with respect to setting appropriate baseline and program savings assumptions.

To support the evaluation, the evaluation team conducted in-depth interviews with program staff, builders, and building inspection departments; reviewed REM/Rate™¹⁵ models; and analyzed the tracking database. The expected savings from this program were 0.1% of the overall PY6 portfolio of electric savings and 0.3% of PY6 portfolio therm savings.¹⁶ This program was expanded in the Illinois Power Agency 2013 Electricity Procurement Plan Docket 12-0544.

¹⁵ REM/Rate is software developed by Architectural Energy Corporation that calculates heating, cooling, hot water, lighting, and appliance energy loads for new and existing homes.

¹⁶ Note that the percentage of expected savings is calculated based on the AIC filing dated January 20, 2011, which includes Non-Residential New Construction.

Impact Results

This program achieves energy savings by incentivizing builders to produce homes that use less energy than homes built to current baseline specifications. This analysis defined a home built to current baseline specifications as one built to local code requirements. Illinois has adopted International Energy Conservation Code (IECC) 2012 as a statewide code, yet many jurisdictions within the AIC service territory have not enforced or officially adopted the code. The evaluation team evaluated homes in each jurisdiction based on their adoption of code. An area not enforcing an energy code had a lower baseline than an area enforcing IECC 2012.

The evaluation team verified participating homes and ex ante savings estimates by reviewing energy analysis models for a random sample of 75 participating homes in the tracking database. We verified that the model runs used input values consistent with identifying information in the tracking database, and that HERS ratings levels matched the model outputs. We verified that all participants in the sample frame were correctly categorized by HERS index, incentive level, and building type. We found that no homes were missing or mis-categorized in the sample of 75 homes, resulting in a 100% verification rate.

Table 18 below applies these participation results to the project population, showing 100% verification overall.

Table 18. Summary of ENERGY STAR New Homes Program Participation Verification Results

Home Type	Incentive Level	Fuel Type	Tracking Participants	Verified Participants	Verification Rate
Single-Family	ENERGY STAR 2.5 or 3.0 Base	Electric	5	5	100%
		Gas	10	10	100%
		Combo	133	133	100%
	HERS 71-85	Electric	3	3	100%
		Gas	0	0	-
		Combo	2	2	100%
	HERS 56-70	Electric	1	1	100%
		Gas	3	3	100%
		Combo	18	18	100%
	HERS ≤ 55	Electric	2	2	100%
		Gas	0	0	-
		Combo	31	31	100%
Multifamily	ENERGY STAR 2.5 or 3.0 Base	Electric	0	0	-
		Gas	0	0	-
		Combo	0	0	-
	HERS 71-85	Electric	19	19	100%
		Gas	0	0	-
		Combo	0	0	-
	HERS 56-70	Electric	75	75	100%
		Gas	0	0	-
		Combo	0	0	-
	HERS ≤ 55	Electric	0	0	-
Gas		0	0	-	

Home Type	Incentive Level	Fuel Type	Tracking Participants	Verified Participants	Verification Rate
		Combo	0	0	-
Total			302	302	100%

The evaluation team calculated savings for each participant, by comparing the REM/Rate model estimated energy consumption to that of a similar home meeting the local energy codes. We then applied a deemed 0.8 net-to-gross ratio (NTGR) to estimate net savings. As shown in Table 19, ex ante and ex post net savings differ, as we estimated ex post savings from PY6 participant REM/Rate models and ex ante savings allocated between gas and electricity.

Table 19. PY6 ENERGY STAR New Homes Program Impacts

Savings	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Total MWh	777	57%	443	0.80	354
Demand Savings (MW)					
Total MW	0.27	35%	0.10	0.80	0.08
Gas Savings (Therms)					
Total Therms	33,826	69%	23,193	0.80	18,554

Based on the evaluation of program data, the evaluation team presents the following key findings:

- Energy savings planning estimates (ex ante estimates in the tracking database) have not kept pace with changing energy codes in Illinois. While enforcement of those codes appears low, we defined the baseline for each home in this program year as the current adopted code.
- Multifamily homes achieved greater electric savings than anticipated, partially due to program multifamily homes using electric heating systems; those homes exceeded their planning estimates by 20%.

Process Results

After major program changes in PY5, PY6 represented a growth and building year for the program. Although program participation fell short of its PY6 goal, program-tracking data show a 74% increase in participation over PY5, with more builders and raters participating than ever before. Further, program-eligible homes accounted for approximately 11% of all new homes built within the AIC service territory.¹⁷ Single-family builders tended to participate in the HERS-only, non-certified category, with 71% of all single-family participation. By contrast, 80% of all multifamily participation occurred in the double bonus ENERGY STAR-certified category. Multifamily units were on average less efficient than single-family homes built through the program, with many homes and units exceeding a HERS index of 70.

Despite the increase in participation, program awareness appears relatively low among non-participating builders and even among some participating builders (who appeared to confuse the program with the new

¹⁷ From January to July 2014, 1,564 building permits were issued for single-family homes and multifamily units in AIC service areas. Adjusting program participation of 302 for 7/12 of the year provides a market share of approximately 11%.

2012 code), suggesting that the program could benefit from additional branding or training. Additionally, many builders reported that homebuyers do not prioritize energy efficiency, nor do the builders make an effort to market their program homes any differently than their non-program homes.

Builders generally expressed satisfaction with their participation in the program, identifying only such areas as speed of rebate processing and regular communications as areas for improvement.

Finally, the program currently conducts a desk review of qualifying homes. This system has worked well for the program at its current size; however, as program participation continues to grow, the addition of an on-site verification component may help mitigate any quality control issues in the future.

Recommendations

Based on the PY6 evaluation, the evaluation team offers the following recommendations:

- Establish communications milestones with builders (such as “application received” and “rebate being processed”) to quickly and easily maintain communications and improve satisfaction levels. The new CSG account managers hired to process paperwork could also track and follow up on missing paperwork from new builders, thus circumventing future rebate processing delays.
- Given a relatively small pool of raters and a growing pool of participating builders, an opportunity exists for program staff to establish regular and consistent communication with builders and raters and/or to recruit additional raters and builders to support the program. A simple quarterly email update (also provided by regular mail) could help build the program’s brand and remind builders of the value of participating in the program.
- Consider offering sales training for builders, teaching them to market the benefits of an energy-efficient program home; this would include methods to use AIC marketing materials and key points for sales discussions.
- Consider implementing an enforceable maximum HERS (such as 70 or 65) and a sliding incentive scale. For example, offer builders a \$50 additional incentive for every HERS point they achieve below a specified level. One southwestern U.S. utility successfully employed this model for its new homes program and consequently achieved greater savings from the program.
- Consider conducting on-site verification for a small portion of program homes (such as 10%) to maintain a high level of quality control as the program grows.

3.10 C&I Standard Program

AIC expected the Commercial and Industrial (C&I) Standard Program to account for 17% of the savings from its portfolio of electric savings programs and 29% of the savings, in therms, from its gas savings programs.¹⁸ The Standard Program’s savings come from the core incentive offering, the online store where customers can buy energy-efficient products at reduced prices, and the Green Nozzle initiative.

Our evaluation of the Standard Program included impact and process assessments. We reviewed program materials and program-tracking data; interviewed program administrators, implementation staff, and participating trade allies; made site visits to assess large lighting projects; and conducted other research. Our quantitative research included a survey of customers who participated in the core program.

Below we present the key findings of the PY6 evaluation.

Impact Results

Our participant verification activities showed that AIC is accurately tracking the measures installed and operating due to the program. As shown in Table 20 the electric and gas gross realization rates for all program components are close to 100%. Table 20 also provides the PY6 Standard Program net impacts. As outlined in the evaluation plan, the team applied the PY4 net-to-gross ratios (NTGRs) for all of the program’s components in developing estimates of net savings. The PY6 Standard Program achieved 55,332 MWh in net electric savings and 972,082 therms in net gas savings. This level of savings enabled the program to exceed its internal PY6 electric and gas goals.

Table 20. PY6 C&I Standard Program Impacts

Program Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Core Program	64,612	1.00	64,415	0.65	41,737
Online Store	16,579	1.00	16,584	0.83	13,764
Green Nozzle	26	1.00	26	0.92	24
Total MWh	81,217	1.00	81,024	0.69	55,525
Demand Savings (MW)					
Core Program	13	1.00	13	0.63	8
Online Store	3	1.01	3	0.83	3
Green Nozzle	0	N/A	0	0.92	0
Total MW	16	1.00	16	0.67	11
Gas Savings (Therms)					
Core Program	972,806	1.00	971,133	0.98	954,210
Online Store	0	N/A	0	N/A	0
Green Nozzle	9,424	1.00	9,424	0.89	8,387
SBDI (Gas only)*	0	N/A	10,176	0.90	9,158

¹⁸ Three-Year Evaluation Plan for the Ameren Electric & Gas Residential and Commercial Portfolios, PY4-PY6

Portfolio Results

Program Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Big Bonus (Gas only)*	892	0.48	430	0.76	327
Total Therms	983,122	1.01	991,163	0.98	972,082

* Gas savings from two small business program offerings made through the Illinois Power Agency, but supported with 8-104 funds to allow for the provision of a small amount of gas-saving measures, are claimed here. See Appendix C for details.

Process Results

In PY6, the Standard Program completed a highly successful year in terms of participant satisfaction while meeting its savings goals. Now in its sixth year, the program is relatively mature, and its implementation remains relatively stable. AIC made minor adjustments to the program's design and implementation in PY6 to ensure the program received a pool of quality projects to draw from, and the utility improved its program data tracking systems in preparation for the launch of a new application system in PY7.

AIC continued to receive overwhelmingly positive customer feedback on the program. Since its inception, the program has seen high levels of participant satisfaction in nearly all program areas—from program paperwork, to processing incentives, to addressing customer questions and concerns. PY6 continued this trend, with 95% of participants reporting overall satisfaction¹⁹ with the program and all defined program areas examined in our evaluation receiving high marks from participants. Consistently performing at this level has likely helped ensure that participants continue to return to the program year after year.

Nevertheless, our evaluation was able to identify some areas in which the program could improve. Our recommendations for the program are as follows:

- **Explore restructuring the AweSummer bonus offering.** Most program allies reported that that the AweSummer bonus, intended to encourage projects to enter the program early, did not markedly speed the progress of any of their projects. Instead, projects already in the pipeline received an unexpected bonus from the program. Half of the participants interviewed who had received an AweSummer bonus indicated they would have been just as likely to install the same project without the bonus. While the program is meeting its goals, restructuring or eliminating the AweSummer bonus offering could help it attain more savings with the same level of program expenditure.
- **Encourage Energy Advisors and other program staff to fully leverage the features of Amplify, the new program-tracking database²⁰.** Energy Advisors strongly believe the customer lead tracking features built into Amplify will be very useful in conducting customer outreach, but they indicate that the database is not being used to its full potential. AIC should consider working with program staff, implementers, and Energy Advisors to increase the customer contact information entered into Amplify to improve the usefulness of its lead tracking capabilities so they can take greater advantage of the new system.

¹⁹ A score of 7, 8, 9, or 10 on a scale of 0 to 10, where 0 means not at all satisfied and 10 means very satisfied.

²⁰ In addition to dedicated program marketing, technical review, and call center staff, the ActOnEnergy Business Program has seven regional Energy Advisors who market and support energy efficiency projects to AIC commercial and industrial customers. Energy Advisors focus on helping customers identify and address opportunities for energy efficiency through participation in the Standard, Custom, and Retro-Commissioning programs.

- **Fine tune the information collected in the application and program-tracking database.** Although the program achieved a gross realization rate of nearly 100%, we found some minor data discrepancies in the course of our engineering review. We recommend ensuring that the database matches exactly what is on the application forms; shifting to an online application as planned should minimize any transcription errors.

3.11 C&I Custom Program

In PY6 (June 1, 2013–May 31, 2014), AIC expected the Commercial and Industrial (C&I) Custom Program to account for 23.4% of the overall portfolio electric savings and 4.5% of portfolio therm savings.²¹ Savings from the Custom Program come from the custom incentive offering, the Competitive Large Incentive Projects (CLIP), projects related to Staffing Grant, and New Construction Lighting projects.²²

The PY6 evaluation of the Custom Program involved both impact and process assessments. To support the process evaluation, we interviewed Staffing Grant, CLIP, and New Construction Lighting participants, as well as program administrators, participating program allies, and Energy Advisors. Our impact evaluation research efforts included a survey with customers who installed gas measures through the Custom Program, Staffing Grant interviews, and site visits to determine gross electric and gas impacts.

Below we present the key findings from the PY6 evaluation.

Impact Results

Overall, the PY6 Custom Program performed well. As shown in Table 21 below, the program achieved 104,507 MWh in gross electric savings and 1,674,147 therms in gross gas savings. In addition, realization rates across savings categories were generally high. The table also provides the PY6 Custom Program ex post net impacts.²³ As outlined in the evaluation plan, the team applied the PY3 net-to-gross ratios (NTGRs) to ex post gross savings for all of the program's components to estimate net savings. The PY6 Custom Program achieved 78,380 MWh in net electric savings and 1,255,610 therms in net gas savings. This level of savings enabled the program to exceed its PY6 electric and gas goals.

²¹ Based on Three-Year Evaluation Plan for the Ameren Electric & Gas Residential and Commercial Portfolios, PY4–PY6. Note that these shares do not include New Construction Lighting projects, as New Construction is included as a separate program in the Three-Year Plan.

²² While AIC processes most new construction projects through the Standard program, lighting and HVAC projects are processed through the electric Custom program with lighting projects falling under the New Construction Lighting offering and large-scale HVAC projects included the custom incentive offering.

²³ “Ex post” refers to the estimated impact found by the evaluation team.

Table 21. PY6 C&I Custom Program Impacts

Component	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
Total MWh	99,277	105%	104,507	0.75	78,380
Demand Savings MW					
Total MW	13.2	89%	11.7	0.75	8.8
Gas Savings Therms					
Total Therms	1,836,207	91%	1,674,147	0.75	1,255,610

Process Results

In PY6, the Custom Program completed a highly successful year in terms of its performance against goals and participant satisfaction. Now in its sixth year, the program’s implementation has remained relatively stable. However, the program did adjust its design and implementation, including the introduction of the Metering and Monitoring Pilot and the launch of an improved behind-the-scenes program data tracking system to prepare for the new application system in PY7.

Conclusions and Recommendations

Interviews with different types of participants (CLIP, New Construction Lighting, and Staffing Grant) and other stakeholders (program allies and Energy Advisors) revealed positive feedback on the program, as well as some areas in which the program could improve. Based on the team’s PY6 evaluation activities, we make the following recommendations for the program:

- **Consider a review of CLIP communication and responsiveness.** While CLIP participants indicated high satisfaction, each participant who recommended improvement cited some aspect of implementer-participant communication. One indicated being unaware of Custom and Standard Program options. Another questioned the program’s continued funding for the program and had difficulty receiving a satisfactory answer from the program. A third participant became nervous about the continuation of their project after not receiving a confirmation from the implementer about having received the participant’s project update. In each case, responsive communication would likely have alleviated the issue and increased satisfaction. Reviewing the communication procedures for CLIP may yield opportunities for improvement in this area.
- **Consider sector-specific technical assistance.** Several CLIP respondents indicated that increased access to industry-specific technical assistance might increase program participation by allowing potential participants to identify custom projects that they would otherwise not be able to identify. While an energy audit, or a feasibility study, from AIC may identify some opportunities, other opportunities that require a thorough knowledge of industry-specific equipment and processes may be overlooked.
- **Encourage Energy Advisors and other program staff to fully leverage the features of Amplify.** Energy Advisors strongly believe the lead-tracking features built into the new program tracking database, Amplify, will be very useful to them in conducting customer outreach. However, information reported by Energy Advisors indicated that the database was not yet being used to its fullest potential. Energy Advisors need to more fully take advantage of the new system by incorporating more useful

information on customer contacts into the system. AIC should consider working with program staff, implementers, and Energy Advisors to increase the amount of information entered into Amplify to improve the usefulness of its lead tracking capabilities.

3.12 C&I Retro-Commissioning Program

The ActOnEnergy Retro-Commissioning Program helps customers evaluate their existing mechanical equipment, energy management, and industrial compressed air systems to identify no-cost and low-cost efficiency measures to optimize energy systems. Customers contract with pre-approved Retro-Commissioning Service Providers (RSPs) to perform an energy survey, resulting in a written report detailing the savings opportunities. Following verified implementation of measures with a payback of less than 12 months, AIC pays a survey incentive that covers 50%–80% of the survey cost, based on the project type. A further implementation incentive is paid to the customer based on the energy saved, and a bonus is paid to the RSP based on timely measure implementation and energy saved.

Prior to PY4, the program focused on health care customers and compressed air for large industrials. In PY4, AIC expanded outreach to the commercial buildings and industrial refrigeration markets. Relatively few projects were completed in these markets in PY4 and PY5, but in PY6, more than one-third of all projects were commercial or industrial refrigeration. For PY6, AIC planned to garner 1% of the portfolio electric energy savings and less than 1% of the portfolio therm savings from this program.²⁴

The PY6 evaluation includes gross impact results plus an evaluation of program processes and forward-looking net-to-gross ratio (NTGR) research. Our quantitative impact research included engineering reviews of a stratified random sample of retro-commissioning projects plus on-site inspection and verification of measures. The process evaluation reviewed program materials and program-tracking data, and interviewed program administrators, service providers, and customers. According to collaborative agreement, this evaluation applies the NTGR found through PY4 research to PY6 results. AIC will apply the current NTGR research values in future years, giving AIC opportunity to adapt, as needed.

Below we present the key findings of the PY6 evaluation.

Impact Results

Table 22 summarizes reported and verified program participation by the different program components. Twenty-six projects were completed in the PY6 program (22 electric and gas projects, and 4 gas-only projects). Among the 26 projects, there were 19 unique customers with two customers representing multiple locations. Three participants saved both electricity and gas—one commercial customer and two health care facilities. One customer took steps to begin participation in the program with initial walk-throughs to determine retro-commissioning feasibility, and AIC paid the RSP a “stipend” for this task. Since stipend costs occurred in PY6, they will be included in program cost-benefit analysis, although there are no projects or impacts associated with this site within PY6.²⁵

²⁴ Planned portfolio-level savings estimates are based on the AIC Plan 2 Filing (September 20, 2011).

²⁵ The customer may choose to implement study-recommended measures in PY7.

Table 22. PY6 Retro-Commissioning Program Participation

Program Component	Unique Customers*	Unique Projects (N)	Program Participation (N)	
			Electric	Natural Gas
Industrial Refrigeration	2	2	2	0
Commercial Building Retro Cx	1	7	7	1
Compressed Air Retro Cx	10	10	10	0
Health Care Retro Cx	6	7	3	6**
All Projects	19	26	22	7

* Two customers submitted multiple projects with the program at different sites.

** Four of the six natural gas health care projects included only gas measures because the customer receives electric service from another distributor.

Source: Amplify database, October 2014.

The evaluation team performed an engineering review of 15 of the 26 projects (including 3 of 7 natural gas sites) to obtain gross realization rates for the program savings. The evaluation team modified the program ex ante gross savings for several reasons, although ultimately the gross realization rates were relatively high (0.90 electric energy and 1.00 gas therms). The evaluation team applied NTGRs to the gross savings estimates to calculate program net impacts. Table 23 summarizes PY6 gross and net impacts.

Table 23. PY6 Retro-Commissioning Program Impacts

Savings	Ex Ante Gross	RR	Ex Post Gross	NTGR	Ex Post Net
Energy Savings MWh					
Total MWh	12,091	0.90	10,892	0.95	10,347
Demand Savings MW					
Total MW	N/A	N/A	N/A	N/A	N/A
Gas Savings Therms					
Total Therms	248,851	1.00	248,851	0.95	236,408

* Gross impacts are based on tracking system data and evaluation research.

** Net savings for both ex ante and ex post impacts use a NTGR of 0.95 for both electric and gas, based on PY4 research.

Process Results

The PY6 evaluation plan for the Retro-Commissioning Program called for a process evaluation of the program with input from program staff, participants, and service providers. The high-level results of the process evaluation show a relatively mature program with well-established processes that generally work well for participants, service providers, and staff. Most interviewed subjects were satisfied with the program and participants would recommend the program to their peers.

However, the evaluation team heard some of the same concerns that service providers have raised previously and identified some continuing issues from the evaluation perspective.

- Several RSPs noted that the review of verified savings had become burdensome and irregular. They reported a high turnover of implementation contractor staff, and the project reviewers were not as consistent as in the past. Different reviewers gave contradictory instructions, which added to the

project timeline and cost. One RSP thought that the extra work required by implementation staff exceeded the incentives for the study (i.e., they could provide the study at lower cost to the customer without the program).

- Consider issuing standard methods and/or template calculators for common measures to ensure consistent approaches by both providers and implementation staff.
- Consider a collaborative training session with RSPs and project review staff to align verification methods, data, and documentation requirements.
- As in prior years, ex ante savings calculations were frequently not included in reports, or simulation inputs were not detailed. As a result, the evaluation effort was greater due to the need to reproduce calculations from scratch to confirm approximate savings estimates. Including these initial calculations in the project files would ensure that the evaluation team understands all aspects of the project from the perspective of program staff conducting the program's technical review.
 - Consider encouraging RSPs to use more transparent calculations, like spreadsheets, or require electronic input files for simulations when they are used for estimating savings. Require the submission of electronic versions of calculations to ensure that evaluators understand how the RSPs obtain results.
 - Establish default parameters and weather data (TMY3) to use when measured data are not available. AIC, Leidos (the implementing contractor [IC]), and the evaluators should define common default parameters to result in conservative (low-end) savings estimates. RSPs should include measured, site-specific data to supplant these defaults, where possible. This approach will diminish evaluation risk from ex post changes.
- The implementation contractor initiated post-installation inspections in PY4 and continued these in PY6. While the evaluation team applauds these steps to verify implementation, we found that the inspections still lacked sufficient detail and documentation, especially for HVAC retro-commissioning projects.
 - The implementation contractor should document as-found measure parameters with data. If controls are the mode for implementation, screen-captures of the control system should be included in the inspection report. Where possible, post-installation trend logs should also be included and analyzed.
 - The program should standardize demand-savings estimating methods. Savings that affect primarily unoccupied hours do not generally affect peak demand.
 - If additional post-installation trend data are available for compressed air projects, they should be included in verification documentation.

A. Appendix – Detailed Ex Post Savings Results

The following table provided detailed ex post savings results by program. We also provide an Excel version following the table.

	Realization Rate	Verified Ex Post Gross			Deemed/Used	Verified Ex Post Net					Actual	Evaluation Estimate (Where Available)	Participation		Weighted Average Measure Life
	Energy Savings (Ex Ante Gross/Ex Post Gross)	First Year Annual Energy Savings	First Year Peak Demand Savings	Lifetime Savings	Net-to-Gross Ratio	First Year Annual Savings	First Year Peak Demand Savings	Lifetime Savings	First Year Cost per First Year Annual Savings	First Year Cost per Lifetime Savings	Program Costs	Net-to-Gross Ratio	# Units	Units Definition	Years
AIC PY6 Programs	%	MWh/Therms	MW	MWh/Therms	%	MWh/Therms	MW	MWh/Therms	\$/MWh or \$/Therms	\$/MWh or \$/Therms	\$	%			
Residential Programs															
Residential Lighting (Electric)	104%	194,665	24	1,067,116	47%	91,493	11	501,547	\$ 104.40	\$ 19.05	\$ 9,552,043	63% Std./72% Specialty	4,659,601	Bulbs	5.3
Behavior Modification (Electric)	N/A	N/A	N/A	N/A	N/A	41,051	0	41,051	\$ 29.91	\$ 29.91	\$ 1,228,025	N/A	215,460	Customers treated	1.0
Behavior Modification (Gas)	N/A	N/A	N/A	N/A	N/A	1,809,293	-	1,809,293	\$ 0.68	\$ 0.68	\$ 1,228,025	N/A	224,430	Customers treated	1.0
HVAC (Electric)	101%	12,289	-	227,088	59%	7,300	4	134,901	\$ 576.89	\$ 31.22	\$ 4,211,303	51%	10,915	Program measures	18.5
HVAC (Gas)	100%	1,540,896	-	31,002,352	77%	1,186,946	-	23,880,987	\$ 2.21	\$ 0.11	\$ 2,624,302	N/A	12,372	Program measures	20.1
Residential Energy-Efficient Products (Electric)	90%	1,545	0	12,476	82%	1,274	0	10,287	\$ 190.50	\$ 23.59	\$ 242,692	N/A	7,314	Program measures	8.1
Residential Energy-Efficient Products (Gas)	78%	109,111	-	643,282	90%	98,200	-	578,954	\$ 2.74	\$ 0.46	\$ 268,913	N/A	7,314	Program measures	5.9
Appliance Recycling (Electric)	110%	8,466	1	67,715	63%	5,326	1	42,600	\$ 336.97	\$ 42.13	\$ 1,794,692	52% Ref./62% Freezer	9,277	Participants	8.0
Multifamily (Electric)	100%	9,286	1	74,816	98%	9,075	1	73,116	\$ 251.96	\$ 31.27	\$ 2,286,520	Varies by measure	518	Projects	8.1
Multifamily (Gas)	98%	100,815	-	804,864	99%	100,143	-	799,499	\$ 7.83	\$ 0.98	\$ 783,638	Varies by measure	518	Projects	8.0
Home Performance with ENERGY STAR (Electric)	94%	4,261	2	61,283	91%	3,883	2	55,844	\$ 865.18	\$ 60.15	\$ 3,359,268	Varies by measure	2,863	Participants	14.4
Home Performance with ENERGY STAR (Gas)	109%	503,875	-	9,540,055	82%	411,594	-	7,792,864	\$ 3.66	\$ 0.19	\$ 1,506,209	Varies by measure	2,863	Participants	18.9
ENERGY STAR New Homes (Electric)	57%	443	0	12,847	80%	354	0	10,266	\$ 1,528.85	\$ 52.72	\$ 541,214	42%	302	Participants	29.0
ENERGY STAR New Homes (Gas)	69%	23,193	-	672,597	80%	18,554	-	538,066	\$ 11.00	\$ 0.38	\$ 204,004	101%	302	Participants	29.0
Moderate Income (Electric)	95%	617,197	1	9,633	100%	617	1	9,633	\$ 1,168.76	\$ 74.88	\$ 721,357	N/A	317	Participants	15.6
Moderate Income (Gas)	107%	173,380	-	3,271,328	100%	173,380	-	3,271,328	\$ 3.00	\$ 0.16	\$ 519,447	N/A	317	Participants	18.9
Energy Efficiency Kits (Gas)	60%	62,574	-	490,116	54%	33,832	0	264,990	\$ 0.46	\$ 0.06	\$ 15,589	N/A	48,402	Program measures	7.8
Business Programs															
Custom (Electric)	105%	104,507	12	1,352,380	75%	78,380	9	1,014,282	\$ 124.70	\$ 9.64	\$ 9,774,160	N/A	121	Program measures	12.9
Custom (Gas)	91%	1,674,147	-	21,763,911	75%	1,255,610	-	16,322,930	\$ 1.94	\$ 0.15	\$ 2,435,474	83%	39	Program measures	13.0
Standard (Electric)	100%	81,024	16	955,050	69%	55,525	11	654,487	\$ 147.64	\$ 12.53	\$ 8,197,745	N/A	19,599	Program measures	11.8
Standard (Gas)	101%	991,163	-	6,987,463	98%	972,082	-	6,852,946	\$ 1.01	\$ 0.14	\$ 983,904	N/A	19,599	Program measures	7.0
Retro-Commissioning (Electric)	90%	10,892	0	54,460	95%	10,347	0	51,735	\$ 183.69	\$ 36.74	\$ 1,900,686	92%	22	Projects	5.0
Retro-Commissioning (Gas)	100%	248,851	-	1,244,255	95%	236,408	-	1,182,040	\$ 3.17	\$ 0.63	\$ 750,420	92%	26	Projects	5.0



Appendix
A_Detailed AIC Resu

B. Appendix – PY6 Program Evaluation Reports

Provided under a separate cover.

C. Appendix – PY6 EE Kits Gas Savings

The evaluation team calculated program gas savings (therms) using Illinois Statewide Technical Resource Manual V.2 (TRM) deemed savings values, IPA-approved NTG ratios established through Docket 12-0544, deemed (school-based delivery) and participant reported (direct-mail delivery) water heater saturation rates, participant reported installation rates, and verified measure counts. Table 24 shows these values for each gas saving measure delivered through the direct-mail and school-based delivery channels.

Table 24. PY6 EEKits Gas Savings Assumptions and Variables

Measure	TRM per unit gas savings (therms)	IPA NTG	Direct-Mail Delivery			School-Based Delivery		
			Verified Measures	Gas Saturation	Installation Rate	Verified Measures	Gas Saturation	Installation Rate
Shower Head: 1.75 gpm	10.78	77%	5,876	29%	41%	2,062	84%	47%
Faucet Aerator (Kitchen)	4.77	46%			51%			42%
Faucet Aerator (Bath)	1.21	46%			47%			43%
Water Heater Temp Adjustment	6.40	46%			34%			22%

Table 25 shows the net savings results at the measure level. The program achieved total net gas savings of 33,832 therms.

Table 25. PY6 Total Program Net Savings by Measure

Measure	Ex Ante Net Savings (therms)	Ex Post Net Savings (therms)
Direct-Mail Delivery		
Shower Head: 1.75 gpm	41,513	5,717
Faucet Aerator*	8,335	7,216
Water Heater Temp Adjustment**	19,216	4,943
School-Based Delivery		
Shower Head: 1.75 gpm	11,974	6,822
Faucet Aerator*	9,617	4,036
Water Heater Temp Adjustment**	5,543	5,099
Total	96,197	33,832

* Reflects weighted average of TRM savings for each faucet type based on participant reported installation rates.

** TRM specifies interactive effects for this measure at -34.2 kWh. Accounting for IPA-approved NTG, verified participation, and gas water heater saturations, this results in negative ex post net savings of -26.4 MWh for the direct-mail delivery channel and -27.2 MWh for the school-based delivery channel. The evaluation team used IPA savings values to calculate electric savings for this program.

For more information, please contact:

Hannah Arnold
Managing Director

510 444 5050 tel
510 444 5222 fax
harnold@opiniondynamics.com

1999 Harrison Street, Suite 1420
Oakland, CA 94612



Boston | Headquarters

617 492 1400 tel
617 497 7944 fax
800 966 1254 toll free

1000 Winter St
Waltham, MA 02451

San Francisco Bay

510 444 5050 tel
510 444 5222 fax

1999 Harrison St
Suite 1420
Oakland, CA 94612

Madison, WI

608 819 8828 tel
608 819 8825 fax

2979 Triverton Pike
Suite 102
Fitchburg, WI 53711

Orem, UT

510 444 5050 tel
510 444 5222 fax

206 North Orem Blvd
Orem, UT 84057