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# Ameren Illinois Company

## Electric & Gas Residential and Commercial Portfolios - PY5 Integrated Evaluation Report

**Final**

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**September 2014**



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# TABLE OF CONTENTS

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1. Executive Summary .....	5
2. Introduction .....	8
2.1 Overview of the AIC Portfolio.....	8
2.2 PY5 Evaluation Approach.....	10
3. Portfolio Results.....	12
3.1 Residential Lighting.....	12
3.2 Residential Behavioral Modification .....	15
3.3 Residential HVAC.....	17
3.4 Residential Energy-Efficient Products .....	23
3.5 Residential Appliance Recycling.....	27
3.6 Residential Multifamily.....	29
3.7 Residential Home Energy Performance .....	31
3.8 Residential Moderate Income.....	34
3.9 Residential ENERGY STAR® New Construction.....	36
3.10 C&I Standard Program .....	39
3.11 C&I Custom Program.....	40
3.12 C&I Retro-Commissioning Program.....	42
Appendix A. PY5 Program Evaluation Reports.....	46
Appendix B. Commission Guidance on Evaluation Efforts.....	47

## Table of Tables

Table 1. PY5 Portfolio Ex Post Net Impacts Compared to Planned Impacts .....	6
Table 2. Portfolio Planned Savings, by Program Year .....	9
Table 3. Portfolio Planned Costs, by Program Year .....	10
Table 4. PY5 Evaluation Activities and Type of Assessment.....	11
Table 5. Bulb Sales by Type and Sales Channel.....	13
Table 6. PY5 Residential Lighting Program Net Energy Impacts.....	13
Table 7. Behavioral Modification Program Participation in PY5.....	16
Table 8. PY5 Behavioral Modification Program Impacts.....	17
Table 9. Summary of PY5 Verification Results .....	19
Table 10. Summary of Databases Analysis Results.....	19
Table 11. PY5 HVAC Program First-Year Savings Net Impacts .....	20
Table 12. Summary of PY5 Program Verification Results.....	24
Table 13. REEP Program <i>Ex Ante</i> and <i>Ex Post</i> Savings .....	25
Table 14. Summary of Participant Verification Results .....	27
Table 15. PY5 ARP Program Impacts .....	28
Table 16. Multifamily Net Impacts by Program Component.....	30
Table 17. PY5 HEP and ESHP Program Net Impacts .....	32
Table 18. PY5 WNCF Program Net Impacts.....	35
Table 19. Summary of Residential ENERGY STAR® New Construction Verification Results .....	37
Table 20. PY5 ENERGY STAR® New Construction Program Net Savings.....	38
Table 21. Standard Program Verification Results .....	39
Table 22. Standard Program Net Impacts .....	40
Table 23. C&I Custom Program Net Impacts.....	41
Table 24. Summary of PY5 Retro-Commissioning Program Verification Results.....	43
Table 25. PY5 Retro-Commissioning Program Gross and Net Impacts .....	44

# 1. Executive Summary

This document contains the evaluation results from the fifth program year (PY5) of the Ameren Illinois Company (AIC) portfolio of commercial and industrial (C&I) and residential energy efficiency resources.<sup>1</sup> PY5 began on June 1, 2012 and ended on May 31, 2013. Opinion Dynamics Corporation, along with its subcontractors The Cadmus Group, Navigant Consulting, and Michael's Energy (the team), were contracted by AIC 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 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 PY5.<sup>2</sup> As Table 1 illustrates, the net realization rates for the entire portfolio are 128% for MWh and 142% for therms.

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<sup>1</sup> For simplicity, this report refers to the period of study as PY5. However, the June 2012 to May 2013 program year is composed of Electric Program Year 5 (EPY5) and Gas Program Year 2 (PY2).

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

Table 1. PY5 Portfolio Ex Post Net Impacts Compared to Planned Impacts

Program	Planned Impacts <sup>a</sup>		Ex Post Net Impacts		Realization Rate <sup>b</sup>	
	MWh	Therms	MWh	Therms	MWh	Therms
<b>Residential Portfolio</b>						
Residential Lighting	61,974	-	129,839	-	2.10	-
Behavioral Modification	21,705	664,517	31,618	1,576,341	1.46	2.37
Appliance Recycling	20,070	-	7,542	-	0.38	-
HVAC	14,187	1,147,316	5,372	964,664	0.38	0.84
Efficient Products	11,999	463,622	1,120	92,691	0.09	0.20
Multifamily	5,217	290,831	16,219	183,061	3.11	0.63
Home Energy Performance & ESHP	2,665	103,916	4,042	690,883	1.52	6.65
Moderate Income	1,774	66,795	541	116,653	0.30	1.75
New Construction	304	14,268	303	11,557	1.00	0.81
Residential Total	139,895	2,751,267	196,596	3,635,850	1.41	1.32
<b>C&amp;I Portfolio</b>						
Custom <sup>c</sup>	61,613	260,954	51,674	729,439	0.84	2.80
Standard	40,648	1,306,813	92,498	2,062,981	2.28	1.58
Retro-Commissioning	3,196	5,002	25,958	486,510	8.12	97.26
Commercial Total	105,458	1,572,768	170,130	3,278,930	1.61	2.08
Portfolio Total	245,871	4,355,658	366,726	6,914,780	1.49	1.59

<sup>a</sup> Source: AIC filing dated January 20, 2011.

<sup>b</sup> The net realization rate is calculated by dividing the ex post net impact by the planned net impact.

<sup>c</sup> These totals include savings for Non-Residential New Construction, which is tracked as part of the C&I Custom Program.

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, both the residential and commercial sectors exceeded their goals. In particular, the team saw trends consistent with PY4 such as the fact that the performance of the Residential Lighting and C&I programs made the greatest contributions to achieving the portfolio goals. The Residential Lighting program achieved 10% more of the overall portfolio MWh than originally expected (from 25% of the portfolio planned impacts to 35% of the actual), while the Standard C&I program achieved 25% of the MWh (compared to 17% planned).

On the natural gas side, the commercial sector performed much better than planned, more than doubling the expected gas savings. Within the residential sector, the savings achieved by the Home Energy Performance, Moderate Income and Behavioral Modification programs offset lower-than-expected performance by the Efficient Products and Multifamily programs.

Key findings for specific programs are:

- The Lighting Program was able to increase its goals by 19% during the year and still meet them. The program made use of increased incentives and off-shelf product placement to meet these goals. Implementation staff credited long-running relationships with participating retailers as the key to securing these product placement promotions. The program also expanded its reach to additional retailer types in PY5 by adding independent grocery stores and more small hardware and discount

stores. According to program staff, some of these retailers started carrying additional efficient lighting products as a result of their participation.

- The HVAC Program significantly increased contractor outreach compared to previous years. Between March and May 2013 there was significant growth in customer participation (up to 200% of monthly targets) and nearly 20% growth in active contractors joining the program.
- The shifting of funds from the Multifamily Program to the HEP Program in PY5, contributed to lower than expected performance of the Multifamily Program compared to filed goals. In addition, the program was also confronted with challenges related to the exhaustion of PY5 funds relatively early in the program year due to high levels of activity from one contractor participating in the Major Measures Component of the program.
- The C&I Programs continued to exhibit strong performance. However, findings from the C&I non-participant survey indicate that the program faces challenges in reaching potential participants. For example, survey results show that only about 40% of non-participants are aware of AIC's ActOnEnergy Business Program and among that group, less than 10% consider themselves very familiar with the program. As a result, the program will need to develop new strategies in the coming years to increase awareness of the program.
- Building on trends seen in PY4, the Retro-Commissioning program has continued to build on the success of prior years and expand leading to savings well in excess of both filed electric and gas savings goals.

## 2. Introduction

This report presents results from the evaluation of the fifth program year (PY5) of AIC's 12 energy efficiency programs. For PY5, the portfolio of residential and commercial programs included the following:

- Residential Lighting
- Residential Behavioral Modification
- Residential HVAC
- Residential Energy-Efficient Products
- Residential Appliance Recycling
- Residential Multifamily
- Residential Home Energy Performance (including the Electric Space Heat Pilot (ESHP))
- 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 PY5 programs. 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 PY5 portfolio had energy goals of slightly over 245 GWh and 4.3 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 in order of magnitude within the residential and commercial portfolios based on a fuel-neutral MMBTU energy savings.

Introduction

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
<b>RESIDENTIAL Portfolio Total</b>	<b>1.7</b>	<b>158,078</b>	<b>139,895</b>	<b>118,521</b>	<b>25.5</b>	<b>25.6</b>	<b>25.1</b>	<b>2,311,593</b>	<b>2,751,267</b>	<b>3,201,714</b>
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
<b>BUSINESS Portfolio Total</b>	<b>1.8</b>	<b>114,938</b>	<b>105,458</b>	<b>97,456</b>	<b>40.1</b>	<b>36.3</b>	<b>33.5</b>	<b>1,391,525</b>	<b>1,572,768</b>	<b>1,704,945</b>
<b>AIC PORTFOLIO TOTAL</b>	<b>1.8</b>	<b>273,534</b>	<b>245,871</b>	<b>216,495</b>	<b>65.6</b>	<b>61.9</b>	<b>58.7</b>	<b>3,735,017</b>	<b>4,355,658</b>	<b>4,942,447</b>

Source: AIC filing dated January 20, 2011.

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
<b>RESIDENTIAL Portfolio Total</b>	<b>\$</b>	<b>25.76</b>	<b>\$</b>	<b>26.10</b>	<b>\$</b>	<b>26.50</b>
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
<b>BUSINESS Portfolio Total</b>	<b>\$</b>	<b>25.71</b>	<b>\$</b>	<b>26.20</b>	<b>\$</b>	<b>26.39</b>
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
<b>AIC PORTFOLIO TOTAL</b>	<b>\$</b>	<b>58.35</b>	<b>\$</b>	<b>59.30</b>	<b>\$</b>	<b>59.96</b>

Source: AIC filing dated January 20, 2011.

## 2.2 PY5 Evaluation Approach

The PY5 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 Statewide Technical Reference Manual (TRM) process. The team implemented all aspects of the evaluation plan for PY5.

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. PY5 Evaluation Activities and Type of Assessment

Evaluation Activity	Residential									Commercial		
	Lighting	HVAC	Behavioral Modification	Home Energy Performance & ESHP	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	●	●				●				●	●	
<b>Ex Post Gross Assessment</b>												
Site Visits	●					●				●	●	
Applied Statewide TRM determined savings values to verified participation value	●	●		●		●	●	●		●		
Calculated savings using research			●		●				●	●	●	●
<b>Ex Post Net Assessment</b>												
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 PY5, 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.
- **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

The next set of sections provides the executive summary information from individual reports on each program. Appendix A presents the full reports of each program.

#### 3.1 Residential Lighting

This report presents results from the evaluation of the Ameren Illinois Company's (AIC) PY5 (June 2012 to May 2013) Residential Lighting Program. The Residential Lighting Program is designed to increase awareness and usage of ENERGY STAR® (ES) lighting products among residential customers through marketing and outreach efforts at participating retailers, community events, and the AIC website. The Program partners with retailers and lighting manufacturers to sell ES lighting at a discount to bring the cost closer to less efficient lighting options on the market. The discounts encourage customers who are reluctant to pay full price for ES lighting to choose energy efficient over standard lighting.

The Program was launched in August 2008 and is implemented by Conservation Services Group (CSG) with subcontractors Applied Proactive Technologies (APT) and Energy Federation, Incorporated (EFI). Across the Program's five years, it has discounted 12,391,945 energy efficient light bulbs and fixtures. This evaluation reviews the Program's performance in PY5, which began in June 2012 and ended in May 2013.

The program is aimed at an eventual transformation of the residential lighting market in AIC territory. The expected savings from this program were 25% of the overall PY5 portfolio electric savings and 0% of the overall portfolio therm savings (including both residential and commercial programs).

To support the evaluation, we conducted in-depth interviews with program staff, reviewed program data and program materials, conducted interviews with customers who were purchasing lighting at participating retailers, and undertook a stocking study of lighting products at participating retailers. We also conducted additional analyses of the in-home lighting study we conducted in the spring and summer of 2012.

#### Impact Results

The Residential Lighting Program sold a total of 2,821,350 bulbs in PY5, exceeding the bulb sales goals the program had set at the beginning of the year by approximately 400,000 bulbs. 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 (88%), the percentage of specialty CFLs sold was double the percentage sold in PY4 (12% compared to 6%)<sup>3</sup>. Though LEDs were not a focus of the program and made up less than 1% of total program sales, the number of LEDs sold increased dramatically compared to PY4 (1,541 compared to 18). More LEDs were sold through the web store than either standard or specialty CFLs.<sup>4</sup> Overall, the web store sold less than 1% of all bulbs sold through the program.

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<sup>3</sup> Throughout this report, we employ the program definition of standard versus specialty CFLs. A standard CFL is a spiral CFL that does not have any special functions. A specialty CFL either has a glass cover over the spiral, or the bulb has special functions such as dimmability or is a 3-way bulb.

<sup>4</sup> The program discounted one LED in retail stores, the "L Prize" winner from Phillips. In addition to the prize-winning bulb, the program discounted two additional LEDs through the web store.

Table 5. Bulb Sales by Type and Sales Channel

Bulb Type	Markdown	Web Store	Total
Standard CFL	2,458,076	494	2,458,570
Specialty CFL	360,618	518	361,136
LEDs	914	730	1,644
<b>Total</b>	<b>2,819,608</b>	<b>1,742</b>	<b>2,821,350</b>

The carryover savings method outlined in the 2012 Illinois Statewide Technical Reference Manual (TRM) spreads program savings across the three years it takes for customers to install all of the bulbs they purchase. For evaluation purposes, AIC chose to begin using this method in PY3. As a result, PY5 savings are from bulbs that were installed in PY5 but could have been purchased in PY3, PY4, or PY5. As shown in Table 6 below, the program achieved net energy impact of 129,839 MWh and net demand impacts of 14.67 MW.

Table 6. PY5 Residential Lighting Program Net Energy Impacts

Energy Impacts	Energy (MWh)		Demand (MW)	
	Ex Ante	Ex Post	Ex Ante	Ex Post
Residential Lighting Program	108,226	129,839	11.44	14.67
<i>PY5 Net Savings Realization Rate</i>	1.20		1.28	

Note: Realization Rate = Ex Post Value / Ex Ante Value.

The Residential Lighting Program’s realization rate for PY5 net demand savings is 1.28, and the realization rate for net energy savings is 1.20. Ex post savings are different from ex ante savings for several methodological reasons:

- The program savings method assumes that 100% of program sales are installed in residential spaces. Our evaluation determined that 3% of bulbs are installed in commercial spaces that have greater hours of use and different waste heat factors.
- The program savings method uses the same hours of use (HOU) for standard and specialty bulbs. Our evaluation uses the different HOU for standard and specialty bulbs provided in the 2012 TRM, which are higher for some specialty bulb types.
- The program savings method uses a wattage-based approach to estimate the base wattage for each bulb. Our evaluation uses the lumen-based method outlined in the 2012 TRM, which resulted in nearly identical program savings (0.001% less with the lumen-based method).
- The program savings method assumes that 100% of bulbs purchased in PY5 are installed in PY5. The evaluation method uses the carryover method outlined in the 2012 TRM, which includes savings from a portion of sales made in PY3 and PY4. The program sold more bulbs in both PY3 and PY4 than in PY5, resulting in greater savings being attributed to the PY5 program.

### Process Results

The Residential Lighting Program ran smoothly in PY5. The program was able to increase its goals by 19% during the year and still meet them. The program made use of increased incentives and off-shelf product placement to meet these goals. Implementation staff credited long-running relationships with participating retailers as the key to securing these product placement promotions. The program expanded its reach to additional retailer types in PY5 by adding independent grocery stores and more small hardware and discount

## Portfolio Results

stores. According to program staff, some of these retailers started carrying additional efficient lighting products as a result of their participation.

In PY5, the program was promoted primarily through the use of 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 all 10 participating stores we visited. We found additional AIC materials describing the benefits of CFLs at nine of the stores.

The program's field representatives conducted a number of in-store product demonstrations with customers and trainings with retailers. 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, 54% of customers who purchased bulbs purchased CFLs compared to 43% of customers when an event was not present. When LEDs are included, close to two-thirds of event customers (64%) purchased an efficient bulb compared to half of non-event customers (49%). Though the events focus on CFLs and not LEDs, the events provide information about the benefits of energy efficient lighting that may encourage customers to investigate the wider variety of products available.

The results from our in-store stocking study and customer interviews provide key information on the state of the lighting market in AIC territory. Both studies show that most retailers in AIC territory continue to stock less-efficient lighting products, and large numbers of AIC customers continue to buy these products. We conducted an inventory of the lighting products on the shelves at the 10 participating retailers where we conducted in-store customer interviews in January 2013. This inventory showed that across all wattages and bulb types, the less-efficient bulb types—incandescents and halogens—comprised 55% of lighting products stocked.

When we examine only standard bulbs—the type impacted by the Energy Independence and Security Act (EISA)—CFLs are more common, but we still found that incandescent bulbs were available across all four wattage categories. We found 75-watt incandescent bulbs in eight of the 10 stores, while 100-watt bulbs were in seven of the 10 stores. Across all wattages of standard bulbs, the most commonly stocked bulb type in early 2013 was CFLs (45% of products stocked), followed by incandescents (38%). Fourteen percent (14%) of 100-watt or equivalent products on shelves were incandescents, while nearly one-third of 75-watt or equivalent products were incandescents. Incandescents are more common among 40- and 60-watt products (57% and 38%, respectively). This makes sense as these products which will be impacted by EISA in January 2014.

As incandescents phase-out, halogens may be phasing-in. EISA-compliant halogens are more common among 100-watt products than the other wattages. Halogens comprise one of every five 100-watt products stocked (21%), and roughly one in 20 of the other wattages (5% to 7%).

Without AIC discounts, our stocking study shows that the CFLs still cost more than halogens and incandescents. The average CFL costs close to \$1 more than the average halogen, which costs just over \$1 more than the average incandescent. Non-discounted CFLs cost twice as much as incandescents. With the AIC discount, the price of the average standard CFL is essentially equal to that of incandescents, and more than \$1 less than the price of halogens.

The average specialty CFL would cost more than twice as much as the average specialty incandescent if AIC did not provide discounts. AIC discounts on specialty CFLs bring their price closer to that of incandescents, but CFLs are still more expensive.

Results from our in-store customer interviews show that not only are stores stocking less-efficient light bulbs, but also that customers are buying them. Despite the presence of AIC-discounted CFLs that are comparable

in price to incandescents, just over half of the standard and specialty bulbs purchased at participating retailers are incandescents or halogens (53%). Incandescents were the most frequently purchased bulb type across all types (48% compared to 44% of CFLs).

## Recommendations

Within this context, we offer the following recommendations for program improvement.

- **Attempt to increase sales of specialty CFLs to increase CFL socket saturation.** We understand that the program is increasing its focus on specialty CFLs in PY6 and increasing incentives. We recommend increasing the incentives on specialty CFLs so they are at least equal in price to incandescent bulbs. Our stocking study found that AIC discounts make the price of standard CFLs equivalent to incandescents, but specialty CFLs are still more expensive even with the incentive. In addition, the program may want to add more candelabra CFLs to its mix of products. Our in-home study found that candelabra bulbs are the most common type of specialty incandescent in AIC homes, though the program discounts and sells more CFL reflectors. We also found that lack of awareness of the variety of CFLs available is a barrier to CFL purchase. We recommend increased marketing to let AIC customers know that there is a CFL for nearly every light socket in their homes.
- **Explore the market for LED incentives.** Although the program's web store makes up less than 1% of program sales, sales through the store suggest that customers are interested in LEDs. The web store sold more LEDs than either standard or specialty CFLs. LEDs are also an avenue for increasing socket saturation of efficient specialty bulbs. CFL saturation of specialty bulbs lags behind that of standard CFL bulbs. Specialty CFLs are more expensive than standard CFLs, which accounts for some of the difference in saturation. However, specialty CFLs also do not perform as well as incandescents and LEDs when it comes to dimmability, which is a desired feature of many specialty bulbs. As the price of LEDs continues to drop, AIC may want to test consumer interest in these bulbs.
- **Track all of the data necessary to calculate program savings using the Illinois Statewide TRM method.** The official program-tracking database does not contain all of the information necessary to calculate program savings using the method outlined in the TRM. The TRM uses a lumens-based approach to calculate base wattages for CFLs, and the program does not track lumens for products sold. The 2012 Statewide TRM also has different savings assumptions based on bulb type (e.g., specialty, standard) and type of specialty bulb (e.g., globe, reflector), which the program does not track. The program uses a wattage-equivalency method to calculate base wattages and does not vary its savings assumptions based on bulb type. Including all necessary data in the tracking database would aid in program tracking, routine reporting, and evaluation.

## 3.2 Residential Behavioral Modification

As a part of its residential portfolio, Ameren Illinois Company (AIC) administers the Behavioral Modification Program. The program began as a pilot in August 2010, and was developed to reduce the energy consumption of AIC's residential customers through encouraging energy-efficient choices. Since then, it has expanded into a full program. The specific goals of the program are to achieve the following:

- Reduce energy consumption by driving energy-efficient behaviors
- Boost customer engagement and education by helping customers understand energy efficiency and save energy in their homes

- Educate customers about no-cost and low-cost energy-saving measures and behaviors

The program offers three different treatment types, including a Home Energy Report (HER) that is mailed to the customer’s home, an electronic copy that is emailed to the customer, and an online portal that customers can access to view their report along with additional information.

Approximately 198,000 dual fuel customers participated in the Behavioral Modification Program in PY5. To support the impact evaluation effort, these customers were divided into three cohorts. Within a cohort, most customers were dual fuel customers, and as such, appear in both electric and gas cohorts. Each cohort has participated in the program for two or three years. In addition, in November 2011 AIC added a gas-only cohort; however, this cohort stopped receiving reports in April 2012, and resumed receiving reports in April 2013. (see Table 7).<sup>5</sup>

**Table 7. Behavioral Modification Program Participation in PY5**

Cohort Name	Fuel Type	Number of Customers Treated in PY5	Start Date	End Date	Program Year
Original Cohort	Electric	42,095	August 2010	NA	Y3
	Gas	42,095	August 2010	NA	Y3
Expansion Cohort 1	Electric	65,608	April 2011	NA	Y2
	Gas	65,608	April 2011	NA	Y2
Expansion Cohort 2	Electric	90,791	November 2011	NA	Y2
	Gas	90,791	November 2011	NA	Y2
Expansion Cohort 3*	Gas	15,016	November 2011	April 2012, resumed in April 2013	NA

\* The customers in this group are gas-only customers. This group was added in the middle of PY4 to assist the program in meeting therm goals, with the intention of dropping them from treatment in PY5. This group received reports in February and March 2012, and then did not receive any subsequent reports until April 2013.

## Results

In PY5, the program saved 31,618 MWh and 1,576,341 therms (Table 8). Adjusted net savings remove energy savings that resulted from customer participation in other AIC programs in PY5.

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<sup>5</sup> While this cohort is no longer part of the program, the evaluation team conducted a billing analysis to assess persistence in savings.

Table 8. PY5 Behavioral Modification Program Impacts

Cohort Name	Fuel Type	Modeled Annual Baseline Usage per H.H. (kWh or Therms)	Adjusted Net Savings per H.H.%	Total Participants (N)	Total Adjusted Net Program Savings: Evaluated Period (MWh or Therms)
Original Cohort	Electric	12,914	1.55%	42,095	8,241
	Gas	9,049	1.04%	42,095	362,576
Expansion Cohort 1	Electric	13,882	1.65%	65,608	15,557
	Gas	10,266	1.30%	65,608	843,523
Expansion Cohort 2	Electric	9,562	0.92%	90,791	7,820
	Gas	6,910	0.54%	90,791	285,645
Expansion Cohort 3	Gas	8,154	0.71%	15,016	84,596
Overall*	Electric	NA	NA	198,494	<b>31,618</b>
	Gas	NA	NA	213,510	<b>1,576,341</b>

\* Note: Total may not equal to the sum of all cohorts due to rounding.

Additional findings include:

- **AIC implemented the program consistently with regard to program design, and no significant changes occurred between PY4 and PY5.** Minor changes included revising language used in reports. However, the number of participants were reduced<sup>6</sup> due to attrition and implementation issues, such as removing customers with an out of state address or those customers considered to be outliers.
- **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 percent savings for savings also tends to increase.
- **Participants continue to save even with interrupted treatment.** Expansion Cohort 3 (the gas-only cohort) stopped receiving program offerings in April 2012 and resumed receiving reports in April 2013. However this cohort continued to achieve savings in PY5 (0.71% net savings per household).
- **The program motivates customers to participate in other residential AIC programs.** All electric and gas cohorts had a higher rate of participation in PY5 in the treatment groups than the control cohorts.

### 3.3 Residential HVAC

The Ameren Illinois Company (AIC) Residential Heating and Cooling Program (HVAC Program) offers customer incentives for the purchase of high-efficiency furnaces, brushless/electronically commutated motors (ECMs), boilers, air source heat pumps (ASHPs), ground source heat pumps (GSHPs), or central air conditioners (CACs), all of which must be installed by an HVAC Registered Program Ally. Incentive levels vary according to equipment types and baseline efficiency levels. In PY5, AIC introduced:

<sup>6</sup> Reduced electric participants from 246,273 to about 198,494 and reduced gas participants from 267,471 to 213,510.

## Portfolio Results

- Higher incentives for most equipment
- Tiered incentives by efficiency level for the CAC and heat pump measures
- A brushless motor incentive (offered with the high-efficiency furnace)
- Early replacement (ER) incentives for boilers and furnaces, in addition to the current incentives

AIC expected this program to produce 6% of the overall PY5 portfolio's electric savings and 25% of the overall PY5 portfolio's therm savings.

This report addresses AIC's PY5, covering the period of June 1, 2012, through May 31, 2013. To support this study, the evaluation team conducted:

- Participant satisfaction surveys
- Non-active registered (NAR) contractor surveys
- Measure installation verifications through phone interviews
- A review of program rebate invoices
- A detailed database analysis

Additionally, the evaluation team installed meters beginning in PY4, which provided information for updating per-unit savings estimates for the next TRM review. In particular, the meter data included total-unit energy consumption, heating and cooling cycle times, and backup heat use. Appendix B of the HVAC Report provides the metering study results.

## Impact Results

Our assessment of the HVAC Program indicates that program tracking accurately captures the number of program participants and measures installed through the program. The detailed tracking information in the database includes information such as unit type, size, efficiency, and measure installation locations. These serve as inputs to the savings algorithms in the Illinois Statewide Technical Resource Manual (TRM), dated June 2012.

As reported in the tracking database, ex ante savings were not based on TRM calculations, but rather assumed a fixed-unit savings value based on past evaluation results. The evaluation team calculated ex post savings for every installed measure, in accordance with the TRM.

Table 9 below shows the number of program participants by measure type, and the number of measures verified through phone surveys and program rebate documents.

Table 9. Summary of PY5 Verification Results

Measure Type	Program Participation (N)	Number of Phone Surveys	Number Verified through Phone Surveys	Number of Document Reviews	Number Verified through Document Review	Gross Verification Rate
Gas Furnace Installations (95/97 AFUE)	5,869	60	60	35	35	100%
Gas Boilers	61	30	30	0	0	100%
CAC/ASHPs	4,408	120	120	28 CACs 2 ASHPs	28 CACs 2 ASHPs	100%
ECM Fans	1,943	30	30	0	0	100%
GSHPs	228	0	0	5	5	100%

The phone survey responses and document reviews indicate that the installed equipment matches the measures reported in the database. Table 10 shows *ex ante* and *ex post* per-unit savings by measure type.

Table 10. Summary of Databases 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	0.292	300		0.301	350		102.9%	116.7%	
CAC ER	1.296	1,235		1.356	1,421		104.6%	115.0%	
ASHP	0.319	1,061		0.360	1,567		112.8%	147.7%	
ASHP ER	1.284	5,907		1.420	4,974		110.6%	84.2%	
GSHP	0.594	3,814		1.742	5,623		293.0%	147.4%	
ECM	0.315	720		0.291	724		92.5%	100.6%	
Gas Furnace			137			134			97.9%
Gas Furnace ER			337			352			104.5%
Gas Boiler			192			154			80.4%
Gas Boiler ER			539			603			112.0%

\*Per-Unit Gross Realization Rate=Ex Post Per-Unit Gross Savings/Ex Ante Per-Unit Gross Savings.

Some *ex post* per-unit savings exceed *ex ante* estimates. This is because AIC estimated *ex ante* savings for each measure based on the minimum new-measure efficiency, and we estimated savings using TRM algorithms for the actual measures installed. For example, incentivized furnaces in the 97 AFUE furnace category may be installing higher-efficiency units than the minimum 97 AFUE requirement, which yields higher savings in our *ex post* calculations. Other reasons for differences may be due to differing assumptions on climate zones compared to where this mix of program participants is located.

As specified by the net-to-gross ratio (NTGR) framework provided in the ICC Order for Docket 10-0568, net savings are estimated using NTGRs of 0.59 for electric measures (ASHPs, CACs, ECMs, and GSHPs), 1.02 for gas furnaces, and 1.01 for gas boilers (which included spillover). These values were derived from the PY3 evaluation results.

Table 11 shows the total program’s net first-year savings impacts.

**Table 11. PY5 HVAC Program First-Year Savings Net Impacts**

Measure	NTGR	Ex Ante Annual Net Savings			Ex Post Annual Net Savings		
		kW	MWh <sup>a</sup>	Therms	kW	MWh <sup>a</sup>	Therms
CAC/ASHP	0.59	2,548	3,439	N/A	2,693	3,662	N/A
ECM Fans	0.59	623	1,427	N/A	525	960	N/A
GSHP	0.59	80	515	N/A	232	750	N/A
Gas Furnace	1.02	N/A	N/A	947,849	N/A	N/A	941,722
Gas Boiler	1.01	N/A	N/A	21,278	N/A	N/A	22,943
<b>Total</b>		<b>3,252</b>	<b>5,381</b>	<b>969,127</b>	<b>3,451</b>	<b>5,372</b>	<b>964,664</b>
<i>Net Realization Rate<sup>b</sup></i>					<b>1.06</b>	<b>1.00</b>	<b>1.00</b>

<sup>a</sup> Totals may not equal sum of measures due to rounding.

<sup>b</sup> Net Realization Rate=Ex Post Net Savings/Ex Ante Net Savings.

### Process Results

The process evaluation included four research tasks:

- Implementer and AIC staff interviews, which helped the evaluation team better understand the HVAC Program and its operations
- A customer satisfaction free ridership and participant spillover survey
- A NAR contractor survey to gather information on program barriers, market effects, and spillover
- A review of AIC’s HVAC Program marketing materials to determine whether they were being developed in line with best practices

Based on these evaluation tasks, we determined that the program operates effectively within the constraints of balancing the portfolio budget. AIC and CSG (its implementation contractor) actively manage the portfolio budget by monitoring program response and adjusting marketing and incentives accordingly. AIC expressed satisfaction with its implementer, and customers report they are satisfied with the overall program, HVAC contractors, and incentives. Most (84%) customers said their experience with the HVAC Program would greatly increase their likelihood of participating in another AIC program. AIC and CSG have incorporated many past evaluation recommendations into the PY5 program.

CSG significantly increased contractor outreach compared to previous years, with March to May 2013 showing significant growth in customer participation (up to 200% of monthly targets), and nearly 20% growth in active contractors joining the program. CSG dedicates two account managers to this program, and they conduct outreach by attending contractor and distributor meetings, and marketing the program to contractors through e-blasts, postcards, and print media. CSG showcases high performers through meetings and e-blasts to encourage competition among contractors.

CSG provides informative, well-structured monthly and weekly reports to AIC. Combined, CSG's weekly and monthly reports provide a good summary of program status, including MWh, therms, and incentive dollars; progress toward goals; and contractor and customer marketing activities. AIC staff expressed interest in having more advance notice of contractor meetings.

Many NAR contractors indicated that their lack of activity resulted from reasons outside of program control, and most did not offer suggestions for improvements. However, some suggestions included streamlining the rebate process, and increasing outreach and support through direct communications by the representative to the contractor and the provision of information brochures.

Despite a delayed launch of the furnace ERs and ECMs due to higher-than-expected participation in other residential programs,<sup>7</sup> customer participation did not continue to fall as it had in PY4, when reductions in federal tax incentives resulted in lower participation. In the last few months of PY5, participation increased significantly. AIC and CSG staff theorized that this increase may be because the HVAC Program is recovering from the effects of both the economic slowdown and changing tax breaks (where tax credits as high as \$1,500 dropped to \$300 or less for most measures).

The evaluation team offers the following recommendations for AIC to consider:

- **Continue efforts to integrate all program-tracking data into a single database and ensure that key HVAC data fields have been completed.** The following values, which are necessary to estimate savings using TRM algorithms, have often been missing in the tracking database:
  - EER of CACs and heat pumps
  - Heating seasonal performance factors (HSPF) of heat pumps
  - Heating and cooling capacity (in Btuh) of ASHPs and GSHPs
  - Partial-load and full-load heating and cooling efficiency of GSHPs

We also recommend flagging the following measure combinations:

- Gas furnace combined with an ECM measure
- AC or heat pumps also receiving an ECM
- Heat pumps installed with a gas furnace
- Any combination heating and cooling replacement with one or both ER incentives
- **Cross-market other AIC programs to HVAC contractors to encourage customer participation.** Many NAR contractors recommended including efficient tank and tankless water heaters in the equipment mix—indicating that they were unaware that rebates are available through other AIC programs. AIC could provide information on other ActOnEnergy programs to contractors to leave with their customers.

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<sup>7</sup> According to program staff, AIC delayed the introduction of ER gas equipment until November 2012 to balance the availability of funding between this program and the Home Energy Performance (HEP) Program.

- **Track marketing efforts.** CSG indicates that it does not track the effects of individual marketing efforts and campaigns. We recommend developing and implementing simple tracking methods and metrics. These approaches could help program managers plan and execute more cost-effective marketing. Tracking methods could include:
  - Utilize a website statistics analytics tool, such as Google Analytics, to determine trends in visitor counts, key sources driving users to the program pages, and visitor interactions with the page.
  - Use campaign-specific or seasonally unique website URLs to track the performance of individual tactics, messaging, or collateral pieces.
- **Track open rates** (percentage of emails opened) of Program Ally-directed emails to determine if certain messaging within emails achieves better response rates.
- **Investigate opportunities to further engage low-activity and NAR contractors.** While CSG has made great progress through contractor outreach, a significant number of low- or no-activity contractors remain. To increase this group's participation, CSG may consider the following:
  - Providing an easily accessible list of incentives, either through a table on the website or as a monthly mailing of incentive levels for contractors that are not online.
  - Offering simplified incentive application processing for small “mom and pop” contractors. For example, consider how to allow customers to submit the forms and contractor receipts directly, or allow the contractors to call in the necessary information to obtain the incentive.
  - Simplifying the re-registration process to encourage contractors to rejoin if they have been dropped from the program. Contacting contractors by phone and helping them complete registration forms might encourage participation.
  - Expanding the recognition program to further incent peer competition and motivate contractor participation.
- **Develop an HVAC Program manual.** Best practices ([www.eebestpractices.com](http://www.eebestpractices.com)) include maintaining an up-to-date manual. This benefits the utility and implementer, as the manual would document all program management elements and retain institutional memory in-house. Manuals can be used to train new staff and provide a guide for daily operations, if existing staff become unavailable for a time. Manuals also clarify activities and roles. They can demonstrate the incorporation of best practice elements in the program.
- **Document and seek feedback on contractor training materials.** While the training deck was clear and concise, utilized consistent branding, and received a favorable review from NAR contractors, the webinar was not available on the website (nor available for our review). Having the webinar recorded and available on the website for contractors to review at their convenience could improve contractor education and participation. The webinar could include information about other AIC programs, and showcase materials available to help registered contractors market the program. AIC could also consider implementing a short survey at the end of the training programs to identify possible opportunities for improvements. Further, AIC could consider making the training mandatory for participating contractors. It could increase contractor engagement and reduce the number of NAR contractors.

- **Refine the formatting for selected marketing materials.** The review of the HVAC Program marketing materials indicated that they currently follow a majority of marketing best practices. However, formatting for some materials could be improved to optimize readability and visual appeal.
- **CSG could add more detailed information to reports.** In monthly reports, CSG should provide details regarding contractor outreach and communications, including all meetings held in the prior month or to be held in the month going forward. This would allow AIC to send representatives to meetings in the area, and to track specific contractor outreach activities on a month-to-month basis.
- **Develop a protocol to verify a sample of all types of installed equipment.** While CSG reviews all documentation to ensure that the correct equipment receives incentives, no physical verification occurs for non-ER equipment. Field verification of the installation quality of the HVAC system will hold contractors accountable for their work. Most utilities target verification of at least 5% of installed HVAC equipment (in the field or via telephone). Currently, field verification only applies to ER equipment.
- **Consider mini-split heat pumps for targeted homes (converting electric baseboard homes).** The program currently only targets homes with central HVAC systems. Several contractors suggested adding mini-split heat pump incentives. Significant energy savings can be achieved when a mini-split heat pump replaces or serves as a supplementary heat source for a home using all-electric resistance baseboard heat. Although overall electric baseboard heat has a low saturation (4%),<sup>8</sup> they are most applicable to multifamily or low-income homes, and may be a good fit for programs targeting those customer segments.

### 3.4 Residential Energy-Efficient Products

The Ameren Illinois Company (AIC) Residential Energy-Efficient Products Program (REEP) reached its highest level of participation in Program Year 5 (PY5). PY5 covered the period June 1, 2012, to May 31, 2013. The program is implemented by Conservation Services Group (CSG), Applied Proactive Technologies (APT), and Energy Federation Incorporated (EFI). Through retailers in AIC's service territory, the program offers customers rebates on the following types of efficient products:

- Programmable thermostats
- Heat pump or efficient gas water heaters
- Air purifiers
- Room air conditioners (RACs)
- Smart power strips

Customers apply for rebates at the time of purchase. The rebate application is attached to the product, making the process of submitting paperwork easy.

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<sup>8</sup> Based on Energy Information Administration, 2009 Residential Energy Consumption Survey:  
<http://www.eia.gov/consumption/residential/data/2009/xls/HC6.9%20Space%20Heating%20in%20Midwest%20Region.xls>.

The expected savings from this program are 5% of the overall PY5 portfolio of expected electric savings, and 11% of the overall PY5 portfolio of expected therm savings.

**Evaluation Methods**

The PY5 evaluation was relatively limited given the past research we have performed. For PY5’s evaluation, we applied measure verification rates based on the PY4 participant telephone survey. We computed gross impacts by applying the algorithms in the Illinois Statewide Technical Resource Manual (TRM), effective June 1, 2012, to information supplied in the program-tracking database. PY5’s net-to-gross-ratios (NTGRs) were also based on self-reported information from the PY4 participant survey. We gathered process evaluation information through a review of program materials and interviews of stakeholders.

**Impact Results**

Table 12 below outlines PY5 program participation levels and the PY4 verification rates. In PY4 customer surveys, we found that a significant percentage of both programmable thermostats and smart power strips are not being used to save energy. Our PY5 ex post savings count only the proportion of thermostats and smart power strips used to reduce energy use.

Table 12. Summary of PY5 Program Verification Results

Measure	Participation**	Verification Rate (PY4)	Verified Participants	Precision at 90% confidence
Programmable Thermostat*	4,975	53%***	2,636	12%
Smart Strip	1,426	46%	656	16%
Room Air Conditioner	1,211	100%	1,211	18%
Air Purifier	964	100%	964	15%
0.67 Water Heater	288	100%	288	17%
Heat Pump	112	100%	112	20%
0.70 Water Heater	48	100%	48	84%

\* The number shown in this table is the actual number of thermostats, as all duplicate thermostats for customers that are both electric and gas customers have been removed.

\*\* Number of rebated measures.

\*\*\*Although we found a verification rate of 53% in PY4, the TRM specifies applying an in-service rate (ISR) of 56% to calculate thermostat savings.

Table 13 shows the PY5 program ex ante and ex post net impacts. Net realization rates vary significantly across measures, mostly due to a different mix of product sizes than assumed (which affects the gross impacts), differences in the ex ante versus ex post NTGR from PY4, and the lower verification rates for thermostats and smart power strips. Ex ante estimates are provided in the tracking database and we do not adjust them.

Table 13. REEP Program Ex Ante and Ex Post Savings

Measure	Savings Type	Ex Ante			Verification Rate	Ex Post			Net Realization Rate <sup>d</sup>
		Gross Savings <sup>a</sup>	NTGR	Net Savings <sup>a</sup>		Gross Savings <sup>b</sup>	NTGR	Net Savings <sup>c</sup>	
Programmable Thermostat AC and Gas Heat	Therms	115,470	0.87	100,459	53%	88,736	0.90	79,863	79%
	MWh	94	0.87	82		72	0.86	62	76%
	kW	0	0.87	0		0	0.86	0	0%
Programmable Thermostat Electric Heat	MWh	526	0.87	458	53%	396	0.86	340	74%
	kW	0	0.87	0		0	0.86	0	0%
Heat Pump Water Heater	MWh	193	0.76	146	100%	265	0.86	228	156%
	kW	9	0.76	7		13	0.86	11	156%
0.67 Water Heater	Therms	7,669	0.58	4,448	100%	12,271	0.90	11,044	248%
0.70 Water Heater	Therms	1,610	0.58	934	100%	1,982	0.90	1,784	191%
Air Purifier	MWh	505	0.76	384	100%	517	0.78	403	105%
	kW	58	0.76	44		59	0.78	46	105%
Room Air Conditioner	MWh	37	0.76	28	100%	35	0.78	27	97%
	kW	35	0.76	26		32	0.78	25	96%
Smart Power Strip	MWh	87	0.76	66	46%	69	0.86	60	90%
	kW	10	0.76	7		8	0.86	7	89%
Total Program	Therms	124,750	0.86	105,841		102,990	0.90	92,691	88%
	MWh	1,442	0.81	1,164		1,354	0.82	1,120	96%
	kW	111	0.81	85		112	0.80	89	105%

<sup>a</sup> Ex ante results are calculated using the values assumed by the program implementer.

<sup>b</sup> Adjusted for verification rate.

<sup>c</sup> Ex post results are calculated using verified installation rates, ex post per-unit savings, and PY4 NTGR.

<sup>d</sup> Net realization rate= Ex post net savings/Ex ante net savings.

## Process Evaluation Results

From the interviews, we learned that overall the program has worked as intended for PY5. Participation increased over PY4, and both the internal gas and electric participation program targets were met. Most participating retailers showed increased participation in PY5 compared to PY4. Since PY4, two measures were dropped (dehumidifiers before PY5, and room air conditioners during PY5) due to a reduction in predicted savings as specified in the TRM algorithm. The long-term feasibility of the program is currently in question by stakeholders who predict that with lower savings estimates and expected lower future avoided costs, the program may not look cost effective in future planning cycles. AIC and CSG have no plans to eliminate the program prior to the next triennial cycle. Products with rebates are available in a wide variety of stores, and program stakeholders are satisfied with store variety and do not plan to expand in the near future. As learned in PY4 and acknowledged by implementers, many customers are not aware of smart power strips and/or do not know how to properly use them, which limits the realized savings from AIC's power strips promotion.

AIC and CSG are using best practice elements—including clear and comprehensive program information, clear call-to-action, easy next steps for program participation, compelling messaging, consistent branding, and professional design—across the majority of the REEP marketing materials, but could make some minor adjustments to improve them, which we detail in the Process Findings section of the report.

We benchmarked the program rebates and found them to be in-line with similar programs offered by other utilities. The only exception was the gas water heater currently receiving a rebate of \$50 to \$75, while other utilities offer rebates as high as \$350. Furthermore, the current rebate for water heaters makes up the lowest share of the incremental cost (13%).

We provide the following recommendations for consideration by AIC:

- **Budget-permitting, increase gas water heater incentives.** Gas water heater incentives are low compared to other utilities, and lower than other measures when compared to the incremental cost. Should AIC wish to increase participation, higher incentives should help drive increased participation without affecting the TRC. However, it will impact overall program budgets.
- **Cross-promote REEP and other AIC programs.** The implementation team has already contacted HVAC contractors through email to reach those who install water heaters. We recommend continuing this effort and finding other opportunities for cross-program promotion. In particular, the Appliance Recycling Program (ARP) may provide another opportunity to educate customers about REEP opportunities. We recommend leave-behind materials and/or talking points for the ARP representatives. Correspondingly, information to promote other AIC programs could be included in rebate check mailings at minimal increased costs.
- **Continue to look for ways to educate customers about smart power strips.** Because they are notably cost-effective, smart power strips have the potential to be an important measure in the program. As found in PY4 customer interviews and PY5 stakeholder interviews, consumers lack awareness about the benefits of smart power strips and how to use them. In response to our recommendation in PY4, AIC added educational information about how to use smart strips to the rebate forms, but more can be done. Leveraging education and outreach efforts already in use for lighting—such as the in-store lighting demonstrations—could address this newer technology to encourage customers to purchase smart strips and use them correctly. This is likely to lead to better levels of understanding than are achieved through the explanation on the rebate forms.
- **Minor website changes may increase program understanding.** Based on our marketing review comparing AIC's website and materials to best practices, we recommend that AIC simplify the

website’s introductory copy and adjust the website layout to introduce the instructions for participation earlier. This would provide customers with a clearer understanding of the next steps for participation.

- **Review program-eligible measures.** We verified all smart strip models in the program database and found that three out of 78 models were not actually advanced power-saving strips. While this did not affect net savings (because it represented only five rebates out of 1,426 paid), we recommend that eligible program models be reviewed for PY6.

### 3.5 Residential Appliance Recycling

The Ameren Illinois Company’s (AIC) Appliance Recycling Program (ARP) offers free recycling of refrigerators, freezers, and room air conditioners for residential and small commercial customers. AIC expected this program to garner approximately 8% of electric savings of its overall portfolio. Conservation Services Group (CSG) manages the program and advertising. Appliance Recycling Centers of America (ARCA) handles the implementation, which includes pick-up and recycling of the appliances as well as scheduling and customer service.

To verify program participation and estimate Program Year 5 (PY5) savings, the evaluation team reviewed and analyzed the tracking database. We calculated savings estimates using a regression equation resulting from an earlier metering study of Illinois program participants as specified in the Illinois Statewide Technical Reference Manual (TRM), dated June 1, 2012. We applied NTGR adjustments based on PY3 evaluation activities and a new refrigerator NTGR to inform future evaluation years.

For the process review, the team interviewed program managers from AIC, Conservation Services Group (CSG), and Appliance Recycling Centers of America (ARCA), the program implementer.

#### Impact Results

##### Gross Impacts

Verification was based on a sample of 140 participants who had recycled refrigerators in PY5. The survey was limited to refrigerators in PY5 and was designed specifically to address concerns from the PY4 evaluation that there may be significant differences in free ridership between primary and secondary appliances. The team applied the PY4 verification rate of 100% for freezers and air conditioners.

Table 14. Summary of Participant Verification Results

Recycling Measure	Participants	Sample	Verified Sample	Verified Participants	Verification Rate
Refrigerator	8,780	140	140	8,780	100%
Freezer	2,899	70 <sup>a</sup>	70	2,899	100%
Air Conditioner	4	N/A <sup>b</sup>	N/A	4	100%
<b>Total</b>	<b>11,683</b>	<b>210</b>	<b>210</b>	<b>11,683</b>	<b>100%</b>

<sup>a</sup> Applied results from PY4 verification

<sup>b</sup> Assumed similar verification to refrigerators and freezers

In 2012, the Illinois TRM introduced a change in the methodology for estimating the annual consumption for recycled refrigerators and freezers, which was based on an in situ metering study conducted in a similar program for Commonwealth Edison (ComEd) in 2012. The revised algorithm for estimating unit energy

consumption (UEC) decreased gross per-unit savings from PY4 to PY5: from 1,239 to 937 annual kWh for refrigerators and from 1,172 to 882 annual kWh for freezers.

We also used our participant survey research to update the part-use factor (percentage of time the product is plugged in) for refrigerators in future evaluations. For PY5 impact calculations the team applied the part use factor specified in the TRM.

### Net Impacts

Table 15 is a summary of PY5 program impacts.

Table 15. PY5 ARP Program Impacts

Program	PY5 Ex Ante <sup>a</sup> Gross Savings		PY5 Ex Post <sup>b</sup> Gross Savings		PY5 Ex Ante <sup>a</sup> Net Savings		PY5 Ex Post <sup>b</sup> Net Savings		Net Realization Rate <sup>c</sup>
	MWh	MW	MWh	MW	MWh	MW	MWh	MW	
Refrigerator	5,768	1.09	7,216	1.1	4,462	0.84	5,701	0.88	128%
Freezer	1,957	0.33	2,243	0.3	1,605	0.27	1,839	0.25	115%
Air Conditioner	4	0.97	2	0.00	4	0.00	2	0.00	42%
<b>Total</b>	<b>7,729</b>	<b>2.39</b>	<b>9,461</b>	<b>1.43</b>	<b>6,071</b>	<b>1.12</b>	<b>7,542</b>	<b>1.14</b>	<b>124%</b>

<sup>a</sup> Ex ante from PY5 reported savings in tracking workbook for refrigerators and freezers, which were AIC’s pre-program estimates. Room AC ex ante based on PY3 results.

<sup>b</sup> Ex post determined by adjusting part-use factors, net-to-gross ratio (NTGR), and verified participation.

<sup>c</sup> Net realization rate= ex post net savings/ex ante net savings

To estimate PY5 net savings, the evaluation team applied the PY3 net-to-gross ratio (NTGR) of 0.79 for refrigerators, 0.82 for freezers, and 1.0 for air conditioners. Ex ante per unit gross savings estimates were lower than ex post, due to a difference in the mix of units recycled compared to that assumed for tracking purposes and the slightly higher part-use factor. This resulted in an overall realization rate of 129%.

### Process Results

While AIC exceeded its internal program savings goal for the year, participation decreased by 18% from PY4, falling from 14,242 to 11,679 appliances. AIC anticipated this decline in participation, which is typically seen in ARP programs elsewhere as the pool of unused or unnecessary secondary refrigerators and freezers is taken out of the market.

When compared to other utility programs, we find similar participation drop-offs. The participation decrease in PY5 may also be due to PY4 participation being unusually high. PY4 was the first full year the program allowed primary appliance recycling. In addition, the program offered higher incentive levels in PY4.

Much of the same program marketing occurred in PY5 as PY4: AIC continued its retail partnership with Sears, continued to double the nonprofit referral bonus from \$10 to \$20 during the winter holiday season (whereby a nonprofit, which the participant names as a referral entity, receives a payment), and continued the use of the Energy Hog as the program mascot.

AIC discontinued television advertising in PY5 as it was not perceived to be cost effective, but added a spring sweepstakes for a \$2,000 ENERGY STAR® appliance shopping spree; anyone who recycled an appliance during January through March were entered for the prize.

## Recommendations

The team provides the following key recommendations:

- While the overall marketing strategy appears to be successful in making the program recognizable AIC should **consider utilizing customer segmentation methods** (such as Nielsen's PRIZM segmentation methodology) in order to identify customers with higher response rates to advertising efforts. This could help mitigate the trend of declining participation as the program matures.
- **Consider ways to identify customers that are likely to have older appliances perhaps by identifying longer established households.** This could result in an increase per-unit savings if marketing can increase the proportion of older units and increase the average age of appliances that are recycled through the program.
- **Consider cross-promotion of AIC programs.** ARP participants tend to be extremely satisfied with their program experience and report being likely to participate in other programs. The cross-promotion can be both to and from the ARP program and can include: conveying information about ARP with the Residential Efficient Products Program (REEP) program rebate checks or leaving behind a flyer with other residential program information when ARP appliances are picked up.
- **Consider a bonus for participants who refer others to the ARP.** A substantial portion of participants were referred to the program by a friend or family member, and ARP participants report that they are likely to recommend the program to others.

## 3.6 Residential Multifamily

This report presents results from the evaluation of the fifth program year (PY5) (June 2012 and ended in May 2013) of the Ameren Illinois Company's (AIC) Multifamily Program. AIC offers the Multifamily Program to owners and managers of residential properties with three or more units in its service territory. The program consists of three different components:

- The In-Unit Direct Install Component, which offers free compact fluorescent light bulbs (CFLs), faucet aerators, low-flow showerheads, programmable thermostats, and water heater setbacks for in-unit installation. The program implementer has staff who install the measures offered through this component.
- The Common Area Lighting Component, which provides rebates for lighting fixture upgrades, and direct install CFLs, occupancy sensors and LED exit signs. Property managers can install rebated measures in this component using their own staff or an independent contractor, and must then apply for rebates.

- The Major Measures Component, which offers incentives for air sealing, attic and wall insulation, and programmable thermostats<sup>9</sup>. Participating contractors perform the bulk of the marketing and all of the installations for this component. This component also offers training for participating contractors.

Conservation Services Group (CSG) implements the Multifamily Program, which launched in November 2008. The expected annual savings from this program were 2% of the overall portfolio of electric savings and 7% of portfolio therm savings (including both residential and commercial).

To support the evaluation, we conducted in-depth interviews with program staff and contractors. In addition, we applied 2012 Illinois Statewide Technical Reference Manual (2012 TRM)<sup>10</sup> savings calculations to the database to obtain gross impacts, conducted a property manager survey to collect net-to-gross ratio (NTGR) information for the Major Measures and Common Area Lighting Components, and conducted site visits to verify measure installation for the In-Unit Direct Install Component.

### Impact Results

The evaluation team applied savings algorithms from the 2012 TRM, and applied measure-level NTGRs to the program-tracking database to determine PY5 net savings. The PY5 Multifamily Program achieved net realization rates of 1.04 for electric savings, 0.79 for demand savings, and 0.88 for gas savings.

Table 16. Multifamily Net Impacts by Program Component

Component	Ex Ante Net Impacts			Ex Post Net Impacts			Net Realization Rate		
	MWh	MW	Therms	MWh	MW	Therms	MWh	MW	Therms
In-Unit Direct Install	8,388	0.70	87,951	8,342	0.79	86,642	0.99	1.12	0.99
Common Area Lighting	401	0.08	0	307	0.06	0	0.77	0.72	n/a
Major Measures	6,833	3.04	120,147	7,570	2.15	96,419	1.11	0.71	0.80
<b>Total</b>	<b>15,622</b>	<b>3.83</b>	<b>208,099</b>	<b>16,219</b>	<b>3.04</b>	<b>183,061</b>	<b>1.04</b>	<b>0.79</b>	<b>0.88</b>

### Process Results

Although the program was performing strongly in PY5, partway through the year AIC made a portfolio-level decision to not shift funds from other programs to continue the Major Measures component. As a result, AIC suspended these measures for the remainder of PY5 once the budgeted funds were exhausted prematurely. However, participants and contractors are satisfied with the program overall. In particular, contractors report that the program is having a positive effect on their business, and that the trainings offered by the program are useful.

The program staff also made several changes to the program design in PY5. First, the program hired staff to perform direct installs of faucet aerators, showerheads, and CFL bulbs, which they do with the assistance of

<sup>9</sup> Only 133 of the 1,245 programmable thermostats installed through the program were installed through the Major Measures Component because programmable thermostats we moved to the In-unit Direct Install Component in early PY5.

<sup>10</sup> State of Illinois Energy Efficiency Technical Reference Manual, Final as of September 14, 2012.

property staff. Previously, the program would rely on the multifamily buildings' maintenance staff to install these measures, and would then follow-up with a quality assurance check. The motivation behind this change was to increase participation in the program and ensure that a greater percentage of distributed measures ended up installed in tenant units. The results of our evaluation suggest that this was a beneficial change, as the number of measures installed in the In-unit component increased by 88% over PY4, and our on-site efforts showed that installation rates ranged from 97% to 99%. The program also decided to offer common area CFLs, exit signs and occupancy sensors as direct install measures, as opposed to offering a rebate on them.

Managing the flow of work, especially in the Major Measures Component, continued to be a challenge for the program in PY5. Program staff indicated that some contractors do such a high volume of work that it can be difficult to monitor program spending. Contractors also felt that they could not accurately gauge when program funds would run out, and were therefore somewhat hesitant to recruit new participants. The shifting of funds to the HEP Program likely exacerbated this issue.

## Recommendations

Key recommendations for the program include the following:

- **Make contractors aware of projected program funding.** The gas side of the program ran out of funds before the end of the year and stopped accepting participants. Contractors are reluctant to promote the program to their customers when they are unsure whether program funds will be available at the time their project is completed. Communicating expected availability of incentives may help alleviate contractors' concerns and allow them to manage customer expectations.
- **Involve contractors who participate in the Major Measures Component in the marketing of the other two components.** Contractors conduct a lot of marketing and networking to recruit participants into the Major Measures Component, and could be a resource for the program if they have marketing materials and information on the other two components as well. If the program plans to use the leads they generate in the Major Measures Component to recruit for other components, AIC should make the contractors aware of that to avoid confusion.
- **To improve the evaluability of the program, track property manager contact information instead of or along with tenant contact information in the tracking database.** The evaluation team found in several cases, especially in the Major Measures Component, that participation and participant contact information were tracked at the tenant level. Ensuring that property manager contact information is tracked in the database would allow for a more accurate understanding of participation counts, as well as cross-participation among program components. It would also facilitate contacting decision makers (i.e., property managers) for data collection efforts.

## 3.7 Residential Home Energy Performance

As a part of its residential ActOnEnergy portfolio, Ameren Illinois Company (AIC) administers the Home Energy Performance (HEP) Program, which includes a smaller component called the Electric Space Heat Pilot (ESHP). This report presents results from the evaluation of the fifth program year (PY5) (June 2012 to May 2013) of the HEP Program.<sup>11</sup>

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<sup>11</sup> While this is the fifth year of the program, the first year was very small, starting in March of 2009 with a few audits.

The HEP Program is a home energy diagnostic offering audits to all AIC residential customers, and retrofits to customers with AIC heating fuel. . The Program offers audits, direct install measures, and incentives for additional energy efficiency opportunities. In PY5, the HEP Program reached a total of 4,152 participants<sup>12</sup>. The ESHP, a home diagnostic component of HEP focused on older homes with electric space heat, went on hiatus for much of PY5 because two Energy Advisors were assigned to Project Storm, a tornado restoration project that focused on home energy efficiency. In PY5, there were 26 ESHP participants.

Conservation Services Group (CSG) implements the program, which provides a small percentage of AIC’s annual savings. The expected annual savings from this program were 1% of the overall portfolio of electric savings and 2% of the overall portfolio of therm savings (including both residential and commercial).

In PY5, we conducted an impact and a limited process evaluation. To support the process evaluation, we reviewed program materials and program-tracking data, and conducted interviews with implementation and AIC staff. Overall, the team used two approaches to estimate impacts: an engineering analysis for the determination of PY5 program impacts, and a billing analysis to provide information on the accuracy of engineering estimates in the TRM (2012).<sup>13</sup>

### Impact Results

The primary objective of this evaluation was to estimate the energy-savings impacts from installing HEP measures. For the engineering analysis, we applied 2012 Technical Reference Manual (TRM) savings algorithms using program-tracking database inputs and the PY3 HEP Program measure-specific net-to-gross ratios (NTGRs) to determine PY5 net savings. Table 17 provides net impacts for the HEP program.

Table 17. PY5 HEP and ESHP Program Net Impacts

Program Component	# of Participants	Ex Ante Net			Ex Post Net		
		kWh	kW	Therms	kWh	kW	Therms
HEP Program	4,126	4,113,163	2,581	714,434	4,000,225	2,856	690,864
ESHP Program	26	50,111	2.03	19.15	41,610	9.64	18.91
<b>Total</b>	<b>4,152</b>	<b>4,163,274</b>	<b>2,583</b>	<b>714,454</b>	<b>4,041,835</b>	<b>2,866</b>	<b>690,883</b>
Net Realization Rate					<b>97%</b>	<b>111%</b>	<b>97%</b>

### Process Results

Overall, the HEP Program was implemented according to its design, with several minor changes in PY5. Some changes were the result of unprecedented program growth, while other changes reflected the program’s long-term objective of becoming a Home Performance with ENERGY STAR® (HPwES) provider.

In PY5, the program moved closer toward its goal of becoming an HPwES program. In particular, the program underwent several minor implementation modifications, including providing HPwES certifications; rebranding program forms with HPwES logos and language; revising intake forms and incentive applications to gather data points to support HPwES qualifications; and changing measures and/or incentive levels to support HPwES standards.

<sup>12</sup> The ESHP Program includes 26 households.

<sup>13</sup> State of Illinois: Energy Efficiency Technical Reference Manual. Final as of September 14, 2012. Effective June 1, 2012.

According to program staff, the program experienced unanticipated and unprecedented program growth in terms of projects and measures installed. In PY5, the proportion of participants who retrofitted their homes via program ally-driven sales increased over the PY4 proportion, resulting in more envelope-measures installed than anticipated. In addition, PY4 measure and incentive levels were maintained moving into PY5, which proved to be more costly than the values used for PY5 planning purposes. This growth required program staff to change measure offerings and incentives midyear in an attempt to control program costs and stay within budget.

This unanticipated growth caused some challenges for trade allies and the AIC customers they serve, as program costs overtook expected budget. At first, program staff did not have a system in place to track pending projects and the associated incentive dollars. As such, staff were unable to communicate to program allies that limited incentive dollars were available, and program allies continued to sell retrofits as the year progressed. To manage program costs and pre-approve incentives before they are committed, program staff instituted a reservation system for incentives as well as monthly envelope-measure production caps to regulate this growth in program ally-driven sales. The new reservation system allows incentives to be tracked prior to approval and expenditure. In PY6, program staff anticipate using the reservation system to ensure that incentive status is clear for contractors and customers.

## Recommendations

The evaluation team used two analytical approaches to derive program impacts. The first was an engineering analysis to estimate program impacts (Table 17), and the second was a billing analysis<sup>14</sup> to provide inputs for future planning efforts.

While the engineering estimates show realization rates very close to 100%, from the billing analysis we found that the HEP Program achieved approximately one-third of anticipated *ex ante* gas net savings, and approximately one-half of *ex ante* electric net savings.<sup>15</sup> We cannot state for certain why there is a discrepancy between the *ex ante* engineering estimates and the billing analysis. After exploring the *ex ante* data and looking closely at the TRM algorithms, we hypothesize that this occurred because of higher-than-expected efficiency in the heating units within homes, and differences in behavioral and household characteristics, including possible take-back (where the participant now has a less drafty home and therefore increases the use of their heating system). However, there is no way to pinpoint the reasons for these differences.

Given the unexpected and low results from the billing analysis, our recommendations are specific to next year's evaluation:

- Consider conducting a second year of billing analysis. A second year of billing analysis will provide additional observations and a wider range of participants from which to refine impact findings. More specifically, we expect that program participants, program offerings, and measure uptake all vary from year to year.
- If there is sufficient budget, a calibrated engineering model could be used in addition to the billing analysis as a second approach to estimating program impacts. Within this approach, an engineering

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<sup>14</sup> The evaluation team conducted a fixed effects linear model incorporating a treatment group of PY4 program participants and a comparison group of PY5 program participants prior to their participation in the PY5 program.

<sup>15</sup> *Ex ante* net savings are based on TRM algorithms and the application of an NTGR.

prototypical home model is created that is then calibrated to the actual use of the HEP participants. It is a different approach than billing analysis, but both take advantage of actual data. Additionally, within a calibrated model, savings from individual measures can be drawn out of the overall results.

- The evaluation team is currently planning to perform in-home lighting audits this summer for a representative group of AIC customers. If that plan is agreed to and moves forward, we can expand our data collection to other pieces of equipment, such as furnaces, to support any explanation for the billing analysis results.

### 3.8 Residential Moderate Income

This report presents results from the evaluation of the second program year of Ameren Illinois Company's (AIC's) ActOnEnergy Moderate Income or Warm Neighbors Cool Friends (WNCF) Program for PY5 (June 2012 to May 2013). The program began as a pilot in PY3.

Implemented by Conservation Services Group (CSG), the WNCF program is a home diagnostic and whole-house retrofit program that focuses on serving AIC customers who do not qualify for low-income weatherization assistance, but cannot afford to pay market prices for energy efficiency retrofit improvements to their homes. The target market is existing 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 the federal poverty level guidelines for household size.

This evaluation reviews the program's performance in Program Year 5 (PY5), which began in June 2012 and ended in May 2013. The expected savings from this program is less than 1% of the overall PY5 portfolio of electric savings and 2% of the overall portfolio of therm savings.

In PY5, 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 AIC staff. Overall, the team used two approaches to estimate impacts: an engineering analysis for the determination of PY5 program impacts, and a billing analysis to provide another estimate of the savings using customer bills. We applied a NTGR of 1.0 to gross savings to obtain PY5 WNCF program net savings. As a result, ex post gross and net impacts are identical.

#### 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 2012 Technical Reference Manual (TRM)<sup>16</sup> savings algorithms using program-tracking database inputs and the PY3 WNCF Program measure-specific net-to-gross ratios (NTGRs) to determine PY5 net savings. Table 18 provides the net impacts for the WNCF program.

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<sup>16</sup> State of Illinois: Energy Efficiency Technical Reference Manual. Final as of September 14, 2012. Effective June 1, 2012.

Table 18. PY5 WNCF Program Net Impacts

Number of Participants	Ex Ante Net <sup>a</sup>			Ex Post Net		
	kWh	kW	Therms	kWh	kW	Therms
260	568,260	441	134,700	540,670	473	116,653
Net Realization Rate <sup>b</sup>				94%	107%	92%

<sup>a</sup> Source of ex ante savings: PY5 program-tracking database.

<sup>b</sup> The realization rate is calculated as the PY5 net ex post savings divided by the PY5 ex ante net savings.

### Process Results

Overall, program staff implemented the WNCF program according to its design with minor changes and a few challenges. Despite meeting its PY5 participation goal of reaching 260 participants, program staff noted that it is an ongoing challenge to effectively market to potential WNCF participants. Given that participation is limited by eligibility criteria and grant funding, marketing and outreach activities are also limited. Program staff described having reached a balance in PY5 between filling the pipeline with interested customers and providing audits one to two weeks later.

Similar to PY4, program staff state that about 20% of applicants are disqualified because their homes include such items as knob and tube wiring, vermiculite, and holes in the roof. It is often difficult for customers with modest incomes to remediate the problems before they can be accepted into the program. Project coordinators who interface with these customers during the audit provide references to contractors who can remediate disqualifying features.

### Recommendations

The evaluation team used two analytical approaches to derive program impacts. The first was an engineering analysis to estimate program impacts (The primary objective of this evaluation was to estimate the energy savings impacts from installing WNCF measures. For the engineering analysis, we applied 2012 Technical Reference Manual (TRM) savings algorithms using program-tracking database inputs and the PY3 WNCF Program measure-specific net-to-gross ratios (NTGRs) to determine PY5 net savings. Table 18 provides the net impacts for the WNCF program.

Table 18), and the second was a billing analysis<sup>17</sup> to provide inputs for future planning efforts. The billing analysis included a comparison group,<sup>18</sup> providing net savings.

While the engineering estimates show realization rates very close to 100%, from the billing analysis, we found that the WNCF program achieved a little over one third of anticipated *ex ante* electric and gas net savings.<sup>19</sup> We cannot state for certain why there is such a large discrepancy between the *ex ante* engineering estimates and the billing analysis. After exploring the *ex ante* data and looking closely at the TRM algorithms, we

<sup>17</sup> The evaluation team conducted a one-way fixed effects linear model incorporating a treatment group of PY4 program participants and a comparison group of PY5 program participants.

<sup>18</sup> Inclusion of a comparison group acts as the counterfactual and provides what would have occurred absent the program. For this analysis, the PY4 WNCF participants were the treatment group, and the PY5 WNCF participants were the comparison group. Once customers participated in the PY5 WNCF Program, they were dropped from the model.

<sup>19</sup> Ex ante net savings are based on TRM algorithms.

hypothesize that this occurred because of higher-than-expected efficiency in the heating units within homes, and differences in behavioral and household characteristics, including possible take-back (where the participant now has a less drafty home and therefore increases the use of their heating system). However, there is no way to pinpoint the reasons for these differences.

Given the unexpected and low results from the billing analysis, our recommendations are specific to next year's evaluation:

- Consider conducting a second year of billing analysis. A second year of billing analysis will provide additional observations and a wider range of participants from which to refine impact findings. More specifically, we expect that program participants and measure uptake all vary from year to year.
- If there is sufficient budget, a calibrated engineering model could be used in addition to the billing analysis as a second approach to estimating program impacts. Within this approach, an engineering prototypical home model is created that is then calibrated to the actual use of the WNCF participants. It is a different approach than billing analysis, but both take advantage of actual data. Additionally, within a calibrated model, savings from individual measures can be drawn out of the overall results.

### 3.9 Residential ENERGY STAR® New Construction

The Ameren Illinois Company (AIC) ENERGY STAR® New Homes Program targets builders through a package of services consisting of training, technical information, marketing assistance, and incentives to encourage the construction of ENERGY STAR new homes. Implemented by Conservation Services Group (CSG), the program is available to builders of new single-family and multifamily homes that are heated with a fuel (natural gas or electricity) provided by AIC.

In Program Year 5 (PY5), the program adopted a stricter energy efficiency standard, ENERGY STAR Version 3.0. The program also introduced an entry-level tier, providing incentives to cover the cost of the HERS rating for buildings that meet only Version 2.5's standards while the builder becomes more familiar with the program.

AIC and CSG recruit both builders and HERS raters to participate in the program. HERS raters are also asked to recruit builders into the program. AIC, CSG, HERS raters, and builders all promote the program to customers interested in building new homes. Builders participating in the program work with HERS raters, providing building plans for them to review and assign an initial (plan-based) energy efficiency rating. Once an initial rating has been established, CSG approves the home and reserves incentive funding. The HERS rater inspects the home during construction and creates an energy analysis model (REM/Rate™ model) to estimate the home's energy savings as compared to the reference home. CSG pays the builder an incentive based on the actual rating received by the home, once the home has been completed and given a final rating. The categories for the HERS ratings include a rating of 71-85, 56-70, and 55 or lower. The PY5 ENERGY STAR New Homes Program had the greatest participation since the program started, with 174 new homes built compared to 65 in PY4.

CSG historically managed this program through one assigned staff member, who became increasingly stretched in PY5 due to increased program interest. CSG is adding two additional staff members to the team for PY6.

This report addresses AIC's fifth year, which covered the period June 1, 2012, through May 31, 2013. The expected savings from this program were 0.1% of the overall PY5 portfolio of electric savings and 0.3% of PY5 portfolio therm savings. To support the evaluation, we conducted in-depth interviews with program staff, reviewed REM/Rate model results, and analyzed the tracking database.

## Impact Results

The evaluation team verified participating homes and savings estimates by reviewing energy analysis models for a random sample of 22 participating homes in the tracking database. We verified that the model runs were consistent with identifying information in the tracking database, and that HERS Ratings levels matched the model outputs. With the exception of one project that was mislabeled in its efficiency status, all savings estimates were verified. Table 19 below applies these results to the project population, showing 100% verification overall.

**Table 19. Summary of Residential ENERGY STAR® New Construction Verification Results**

Home Type	Incentive Level	Fuel Type	Participants	Verified Participants	Verification Rate
Single-Family	HERS 71-85, Single Bonus	Electric	38	38	100%
		Gas	8	9	113%
		Combo	14	14	100%
	HERSs 56-70, Double Bonus	Electric	10	10	100%
		Gas	6	5	83%
		Combo	15	15	100%
	HERS <=55, Triple Bonus	Electric	4	4	100%
		Gas	-	-	-
		Combo	1	1	100%
Multifamily	HERS 71-85, Single Bonus	Electric	-	-	-
		Gas	-	-	-
		Combo	78	78	100%
	Hers 56-70, Double Bonus	Electric	-	-	-
		Gas	-	-	-
		Combo	-	-	-
	HERS <=55, Triple Bonus	Electric	-	-	-
		Gas	-	-	-
		Combo	-	-	-
<b>Total</b>			<b>174</b>	<b>174</b>	<b>100%</b>

One gas project out of the participant population was incorrectly categorized as HERS 56-70 instead of 71-85, which explains the two verification rates higher and lower than 100%. The evaluation team applied a deemed per-unit savings for each participant, based on the home’s HERS rating level. We then applied a deemed 0.8 net-to-gross ratio (NTGR) to estimate net savings. As shown in Table 20, ex ante and ex post net savings are nearly the same.

Table 20. PY5 ENERGY STAR® New Construction Program Net Savings

Program	PY5 Ex Ante Net Savings			PY5 Ex Post Net Savings		
	MW	MWh	Therms	MW	MWh	Therms
ENERGY STAR New Home	0.11	303.2	11,669	0.11	303.2	11,557
<b>Net Realization Rate*</b>				<b>100%</b>	<b>100%</b>	<b>99%</b>

\*Net Realization Rate = Ex Post Net Savings / Ex Ante Net Savings.

We compared a sample of building modeling files to the deemed savings estimates. Because the program is based on HERS ratings, which do not differentiate between electric and gas savings, builders are capitalizing on gas measures over electric measures. Due to this, across the sampled 22 projects, we found more gas savings than the deemed values and less electric savings.

### Process Results

In PY5, the program exceeded its gas savings target of 10,694 therms. The program fell slightly short of meeting its electric savings target of 352 MWh (303 MWh net achieved). This was due to a few projects not finishing on schedule. Overall, the program ran smoothly and participation increased from PY4’s 65 participants to PY5’s 174 homes (an increase of 168%). Much of this increase is from a large multifamily project with 78 units. Just comparing single-family units, PY4 increased from 62 to 96 in PY5, an increase of 55%, which is significant considering single-family construction permits increased by only 23% between July 2012 and July 2013.

The number of different builders represented actually dropped from 28 in PY4 to 17 in PY5. One builder who did not submit any projects in PY4 submitted 48 single-family projects in PY5. AIC’s participation increases also compare favorably to other utility-run new construction programs. AIC expanded its outreach efforts in PY5, contacting more home builders and raters than in previous years, and also minimally advertised the program directly to potential home buyers.

AIC’s incentives are in line with offerings by other similar programs, although program specifics and requirements vary considerably by program administrator.

Based on the PY5 evaluation, the team provides the following recommendations:

- **Continue to increase marketing to builders.** Much marketing emphasis has been placed on the HERS raters in the past, but as the housing market continues to regain strength, there is a good opportunity to increase the percentage of homes that are being built to meet the ENERGY STAR 3.0 requirements by engaging further with the builders. Builders are recognizing the competitive advantage of offering energy-efficient homes, so we recommend making efforts to recruit new builders.
- **Continue plans to assist HVAC contractors in completing their ENERGY STAR Version 3.0 credential.** As part of the new ENERGY STAR 3.0 requirements, HVAC contractors must complete a training class and receive accreditation documenting their qualifications to install HVAC systems under the program. We concur with CSG’s plans to offer free training to the contractors and assistance with the yearly accreditation fee. Ultimately, training will make the process of building ENERGY STAR 3.0 rated homes easier.

- **Continue plans to implement a new program-tracking database.** Thus far, program data have been tracked in an Excel spreadsheet. As the program continues to expand, a database system will increase program-tracking efficiency.

### 3.10 C&I Standard Program

This report presents results from the evaluation of the fifth program year of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Standard Program for electric and gas energy efficiency. In Program Year 5 (PY5) (June 1, 2012, through May 31, 2013), AIC expected the Standard Program to account for 17% of the overall portfolio electric savings and 30% of the overall portfolio therm savings.<sup>20</sup> Savings from the Standard Program come from the core incentive offering, an Online Store where customers can buy energy-efficient products at reduced prices, and a Green Nozzle offering. In addition, while not formally assessed as part of the PY5 evaluation effort, AIC implemented a pilot Small Business Direct Install (SBDI) program during PY5.<sup>21</sup>

The PY5 evaluation of the Standard Program involved both impact and process assessments. In particular, to support the evaluation we conducted research including a review of program materials and program-tracking data, interviews with program administrators and implementation staff, and site visits to assess large lighting projects. Our quantitative research efforts included a survey with those who utilized the Online Store, and customers who participated in the Core Standard Program. In addition, we conducted a non-participant survey to explore process-related issues and non-participant spillover.

Below we present the key findings from the PY5 evaluation.

#### Impact Results

Overall, our participant verification activities demonstrated that AIC is accurately tracking what is installed and operating due to the program. As shown in Table 21, all of the program records were fully verified.

Table 21. Standard Program Verification Results

Program Component	Program Tracking (# Measures)	Verified Participation	Verification Rate	Method
Core Program	3,505	3,505	100%	Participant Survey & Site Visits
Online Store	73,148	73,148	100%	Database Review
Green Nozzle	110	110	100%	Database Review

Table 22 below provides the PY5 Standard Program net impacts. In developing estimates of net savings, the team applied the PY3 net-to-gross ratios (NTGRs) for all of the program’s components. Overall, the PY5 Standard Program achieved 91,067 MWh in net electric savings and 2,062,981 therms in net gas savings. This level of savings enabled the program to exceed both its internal PY5 electric and gas goals.

<sup>20</sup> Planned portfolio level savings estimates are based on the AIC Plan 2 Filing (September 20, 2011).

<sup>21</sup> The evaluation team reviewed the summary files provided by AIC and included savings from the pilot in the overall impact numbers for PY5. The SBDI program will be evaluated in full during PY6.

Table 22. Standard Program Net Impacts

Program Component	Ex Ante Net			Ex Post Net		
	MW	MWh	Therms	MW	MWh	Therms
Core Program	13	75,261	2,040,058	13	75,130	2,040,058
Online Store	--	18,710	--	--	16,774	--
Green Nozzle	--	110	22,923	--	110	22,923
SBDI Pilot	--	483	--	--	483	--
Total	13	94,564	2,062,981	13	92,498	2,062,981
Net Realization Rate				1.00	0.98	1.00

### Process Results

The Standard Program completed another successful year in terms of participant satisfaction, as well as program performance against goals. Based on lessons learned from PY4, the program made a number of adjustments to its design and implementation processes to ensure an easier participation process, as well as the timely submission of projects.

AIC also 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. Consistently performing at this level has likely helped to ensure that participants continue to return to the program year-over-year. However, as findings from the non-participant survey indicate, the program faces challenges in reaching new potential participants. For example, the research shows that only about a third of non-participants are aware of AIC’s ActOnEnergy Business Program.

Based on the team’s PY5 evaluation activities, we make the following recommendations for the program:

- **Formulate goals for the program’s training opportunities.** The introduction of a training program in PY5 is a huge accomplishment for the program. However, while awareness of these opportunities after the first year is moderate, few customers have actually participated, and interest in participating in the future is low. As a result, program staff should determine whether they would like to grow participation in sponsored training activities, or whether simply making them available to customers is sufficient. If growth in this area is a goal in PY6, program staff may wish to consider focus groups or other forms of research with their customers to ensure that the training offered aligns with their goals and interests.
- **Target free lighting kit recipients as part of Core Program and Online Store marketing efforts.** As in prior years, savings from the free lighting kit offer continue to drive Online Store savings. Further, this effort reaches a significant number of customers who generally do not go on to purchase products from the Online Store. In an effort to engage this group of customers and encourage repeat participation, program marketing staff should consider targeted outreach to this group with information about Online Store promotions as well as information on all of the ActOnEnergy Business Program offerings.

### 3.11 C&I Custom Program

This report presents results from the evaluation of the fifth program year of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Custom Program for electric and gas energy efficiency. In Program Year 5

(PY5) (June 1, 2012 through May 31, 2013), AIC expected the Custom Program to account for 25% of the overall portfolio electric savings and 6% of the overall portfolio therm savings.<sup>22</sup>

The PY5 evaluation of the Custom Program involved both impact and process assessments. To support the evaluation we conducted research including a review of program materials and program-tracking data, interviews with program administrators and implementation staff, interviews with Staffing Grant recipients, and site visits to assess gross impacts. Our quantitative research efforts included a survey with Custom participants, as well as a non-participant survey to explore process-related issues and non-participant spillover.<sup>23</sup>

Below we present the key findings from the PY5 evaluation.

### Impact Results

Overall, the PY5 Custom Program performed well and exceeded internal net savings targets. As shown in Table 23 below, the program achieved 51,674 MWh in net electric savings and 729,439 therms in net gas savings. In addition, net realization rates are generally high.

Table 23. C&I Custom Program Net Impacts

Program	Ex Ante Net Impacts			Ex Post Net Impacts		
	MW	MWh	Therms	MW	MWh	Therms
Custom	18	55,782	750,629	14	51,674	729,439
Net Realization Rate				0.76	0.93	0.97

In general, the PY5 results are based on the team’s application of the PY3 Net-To-Gross Ratio (NTGR) for Custom projects. The exception is the development and application of NTGRs for the eight staffing grant participants interviewed as part of the evaluation. The team applied their individual NTGRs on a retrospective basis and the results for these participants had a positive impact on the program.

### Process Results

Overall, the Custom Program approved 172 unique projects in PY5 containing a mix of different measure types, including refrigeration, miscellaneous, and lighting end-uses. This level of activity represents an increase over PY4 in which the program completed 103 projects. In addition, our review of program processes and implementation revealed that PY5 was another strong year for the Custom Program. In particular, program satisfaction continues to be high and participants overwhelmingly consider AIC a resource for information on energy efficiency. This positive relationship between the company and its participating customers is likely one reason why over 90% of participants plan to take part in the program again.

However, findings from the C&I non-participant survey indicate that the program faces challenges in reaching potential participants. For example, survey results show that only about 40% of non-participants are aware of AIC’s ActOnEnergy Business Program and among that group, less than 10% consider themselves very familiar

<sup>22</sup> Planned portfolio level savings estimates are based on the AIC Plan 2 Filing (September 20, 2011). In addition, the percentages presented here include savings for Non-Residential New Construction, which is tracked as part of the C&I Custom Program.

<sup>23</sup> The non-participant survey was conducted in conjunction with the C&I Standard Program.

with the program. As a result, the program will need to develop new strategies in the coming years to increase awareness of the program.

In terms of program design, throughout PY5, the program implementation team made a number of modifications to the program to help improve the customer and program ally experience. These include changes to the program ally bonus structure which encouraged earlier completion of Custom and other C&I projects. Additionally, program staff updated their Quality Assurance and Quality Control (QA/QC) processes in an effort to ensure that a wider range of projects are inspected. Across the C&I portfolio, program staff also worked to enhance program applications.

Based on the evaluation team's PY5 evaluation activities, we make the following recommendations for the program going forward:

- **Repeat Participation:** Customers that participated in the Custom Program prior to PY5 contributed a significant portion of the electric and gas savings during this program year. High levels of customer satisfaction with the program, as well as AIC are a likely reason for the level of repeat participation, which presents an opportunity for the program in terms of marketing and outreach. In particular, given that almost a quarter of participants (22%) reported learning about the program from another company (15%) or through word of mouth (7%) having past participants speak about their experiences at events or continue highlighting them through case studies may prove to be an effective way to engage non-participants.
- **Reaching Non-Participants.** One of the potential barriers to participation among non-participants with some knowledge of the program is their perception that the equipment they need will not qualify for incentives. In order to better understand the basis for this belief, the program may want to consider conducting focus groups or other qualitative research with non-participating customers to understand whether this barrier is based on a lack of knowledge about the program or gaps in program offerings. These data collection efforts could also provide an opportunity for message testing or the assessment of marketing collateral, which may help to capture the attention of non-participating customers more generally.
- **Internet Marketing.** The program chose to actively utilize the Internet as a key marketing channel in PY5. As part of this effort, program staff used email, web analytics, search engine marketing, and online advertising to draw attention to the program. The evaluation team recommends the continued use of these tactics. Further, making use of the tracking capabilities will help to assess customer exposure to program messages, as well as the degree to which Internet marketing succeeds in bringing customers to the ActOnEnergy website.

### 3.12 C&I Retro-Commissioning Program

This report presents results from the evaluation of the fifth program year (PY5, June 1, 2012, through May 31, 2013) of the Ameren Illinois Company (AIC) ActOnEnergy Business Retro-Commissioning Program for energy efficiency. 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% to 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 healthcare customers and compressed air for large industrials. PY5 continued the PY4 approach of expanding outreach to the commercial buildings and industrial refrigeration markets. For PY5, AIC planned to garner 1% of the portfolio electric energy savings and less than 1% of the portfolio therm savings from this program.<sup>24</sup>

The PY5 evaluation focuses on gross impact results. Other key evaluation components—net-to-gross ratio (NTGR) research and process evaluation—are scheduled for research in PY6. As a result, the evaluation applies the NTGR found through PY4 research to PY5 results. To support the general aspects of the evaluation, we also reviewed program materials and program-tracking data, and interviewed program administrators and implementation staff. Our quantitative impact research included engineering reviews of a stratified random sample of retro-commissioning projects.

### Impact Results

Table 24 below summarizes reported and verified program participation by the different program components. During PY5, AIC included 34 electric and nine gas facilities (35 total facilities, including participants receiving both natural gas and electricity from AIC) as participants and paid them incentives from the Retro-Commissioning Program. No Commercial Buildings participated and among Healthcare participants, one was gas-only and another was electric-only. The PY5 results include savings for one Compressed Air project that was paid for in PY4, but at that time resulted in no savings due to complementary effects with a pending Custom Program project. The Custom project was completed in PY5, and the Compressed Air retro-commissioning savings are therefore credited in PY5.<sup>25</sup>

**Table 24. Summary of PY5 Retro-Commissioning Program Verification Results**

Program Component	Program Participation (N)		Verified Participants (N)		Realization Rate	
	Electric	Natural Gas	Electric	Natural Gas	Electric	Natural Gas
Ammonia Refrigeration	2	0	2	0	100%	NA
Commercial Building Retro Cx	0	0	0	0	100%	NA
Compressed Air Retro Cx	24	0	24	0	100%	NA
Healthcare Retro Cx	8 <sup>a</sup>	8 <sup>b</sup>	8	8	100%	100%
All Projects	34	8	34	8	100%	100%

Source: AIB database, September 2013.

<sup>a</sup> One Healthcare project included only electric measures because the customer receives gas service from Nicor Gas. AIC and Nicor Gas co-funded this project, and gas savings is included in Nicor Gas’s filed savings.

<sup>b</sup> Another Healthcare project included only natural gas because the customer receives electric service from another utility.

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

<sup>25</sup> This arrangement is by agreement with AIC staff, the implementation team, ICC staff, and the evaluation team, October 2012.

The evaluation team performed an engineering review of 18 of the 35 projects (including three of eight 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 (0.93 electric energy, 0.88 demand, and 0.89 therms). NTGRs are applied to the gross savings estimates for program net impacts. Table 25 summarizes PY5 gross and net impacts.

Table 25. PY5 Retro-Commissioning Program Gross and Net Impacts

Program	Ex Ante Impacts			Ex Post Impacts		
	MWh	MW	Therm	MWh	MW	Therm
Gross Impacts <sup>a</sup>	29,257	3.389	577,834	27,5324	2.995	512,116
Net Impacts <sup>b,c</sup>	16,969	1.965	335,144	25,958	2.845	486,510
<i>Gross Impact Realization Rate</i>				0.934	0.884	0.886

<sup>a</sup> Gross impacts are based on tracking system data and evaluation research.

<sup>b</sup> Ex ante net savings use an NTGR of 0.58 for both fuels, based on “Ameren PY5 Filed Parameters.”

<sup>c</sup> Ex post net savings use an NTGR of 0.95 for both electric and gas, based on PY4 research.

## Process Results

The PY5 evaluation plan for the Retro-Commissioning Program did not call for a formal process evaluation of the program. Process questions will be the focus of the evaluation effort in PY6. Nonetheless, the evaluators noted some process-related observations based on our background research.

Three key findings from our PY5 impact evaluation effort fall into the process category. Based on our engineering review of the projects:

- As in PY4, ex ante savings calculations are frequently not included in reports, or simulation inputs are not detailed. The evaluation effort was greater due to the need to reproduce calculations from scratch to confirm approximate savings estimates, and evaluation estimates are less precise than we normally achieve. Including these initial calculations will ensure that the evaluation team understands all aspects of the project from the perspective of program staff conducting the program’s technical review.
  - This concern is particularly pronounced with the Healthcare facilities sampled for impact 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 submitting electronic versions of calculations to ensure that evaluators understand how the RSPs obtain results. Consider issuing template calculators for common measures to ensure consistent approaches and the use of default parameters and weather data among service providers.
  - Despite the lack of supporting calculations, realization rates are relatively high. High realization rates do not necessarily reflect accuracy in the ex ante estimates; rather, our re-estimations using available data tended to confirm reported savings since there was insufficient documentation that would have allowed the evaluation team to arrive at a different estimate.
- Post-installation inspections by the implementation contractor were initiated in PY4 and continue in PY5. While the evaluation team applauds these steps to verify implementation, we find that the inspections lack sufficient detail, especially for HVAC retro-commissioning projects for Healthcare participants.

- As-found measure parameters should be documented and supported with data. If controls are the mode for implementation, screen-captures of the control system should be included in the inspection report. If possible, post-installation trend logs should also be included and analyzed.
- The program should standardize demand-savings estimating methods for HVAC retro-commissioning. Savings that impact 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.
- Among sampled projects, one measure with claimed savings was entirely manual<sup>26</sup> and subject to poor reliability and short persistence. The evaluation team recommends requiring automation for all controls measures. Allowing manual measures opens the door for spurious claims of savings.

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<sup>26</sup> The noted measure was chilled water reset based on outdoor air temperature to be implemented manually by the operating engineer. *Ex ante* savings are approximately 11,000 kWh.

## **Appendix A. PY5 Program Evaluation Reports**

This appendix is provided in a separate file.

## Appendix B. Commission Guidance on Evaluation Efforts

The ICC Order for Docket 10-0568 dated December 21, 2010, provides significant information about how the evaluation team should use NTGRs and per-unit values, which ones the team should include in its reports, and when per-unit values will be updated. This information is described in the Three-Year Plan, but we provide it here for reference as well.

Key points directly taken from the ICC documents are:

- The Order has a set of fixed per-unit savings values that evaluators are to report in our PY4 evaluation for most measures.<sup>27</sup> For measures without a fixed value, we plan to perform an engineering analysis.
- AIC must apply any updated per-unit values received by March 1 to the next program year (Lines 505-508 of AIC Exhibit 10.0 in the December Order). As evaluation results are generally available in the fall, the earliest application of any results from the evaluation of standard measures will skip a program year. For example, PY4 results are available for application in PY6, and PY5 results are available for application in PY7.
- AIC must work with other utilities and the Stakeholder Advisory Group “to develop a Statewide TRM for use in the upcoming energy efficiency Three-Year Plan” (p.19 Order on Rehearing). Since this document is dated prior to the beginning of PY4, we assume this means PY4-PY6 (i.e., Plan 2).
  - The Statewide TRM consultant is currently working on high-impact measures and then will turn its attention to all the other measures in the portfolio. A draft of the Statewide TRM with values may be available prior to March 1, 2012, but more likely, the final values will not be available until after March 1. Following the timeline from the Order, that would mean that per-unit values should be applied to PY6. We will default to this assumption unless otherwise agreed to in writing with AIC or the ICC Staff.<sup>28</sup>
- The Final Order and Order on Rehearing also provided a framework on how and when to apply NTGRs as well as when any update to NTGRs should be applied. This framework is provided below, verbatim from the Order:
  1. Where a program design and its delivery methods are relatively stable over time, and an Illinois evaluation of that program has an estimated NTG ratio, that ratio can be used prospectively until a new evaluation estimates a new NTG ratio.
  2. In cases that fall under the paragraph above, once new evaluation results exists, these would be used going forward, to be applied in subsequent program years following their determination until the next evaluation, and so on.
  3. For existing and new programs not yet evaluated, and previously evaluated programs undergoing significant changes—either in the program design or delivery, or changes in the market itself—NTG ratios established through evaluations would be used retroactively, but could also then be use

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<sup>27</sup> Updated fixed values for standard measure savings were filed in the Plan 2 docket 10-0568 on December 9, 2011.

<sup>28</sup> We have heard in the ongoing Statewide TRM meetings that ComEd expects to implement some or all of the Statewide TRM measures in PY5. This choice does not follow the timeline in the AIC Exhibit 10.0, although AIC has chosen to follow the same timeline and use Statewide TRM values in PY5.

prospectively if the program does not undergo continued significant changes, similar to the first paragraph above.

4. For programs falling under the third paragraph above, deeming a NTG ratio prospectively may be appropriate if: the program design and market are understood well enough to estimate with reasonable accuracy an initial NTG (e.g., based on evaluated programs elsewhere); or it is determined that the savings and benefits of the program are not sufficient to devote the evaluation resources necessary to better estimate a NTG ratio.<sup>29</sup>

Based on the language above, we have created a three-point set of rules to follow.

1. If the program design and delivery methods are stable over time and a previous Illinois evaluation has estimated a NTGR, that NTGR is used prospectively until a new value is calculated. When the new value is calculated, we will apply the value prospectively following a similar timeline as the per-unit values. For example, if a PY4 NTGR is calculated for a program that has had an evaluation and the program and market are stable, we will apply the new NTGR in PY6.
2. For existing programs that have been evaluated previously but are undergoing significant changes in program design or in the market served by that program, or for existing and new programs that have not yet had an evaluation, an NTGR will be calculated and applied retroactively (i.e., for the year in which program participants are included in the research).
3. If a previous Illinois evaluation has not occurred, it is possible to deem an NTGR based on secondary research showing other NTGR values from similar programs. This approach is used in two cases:
  - a. If the program design and market are well understood
  - b. If the savings of the program are not sufficient to devote evaluation resources

These rules have helped to shape choices made in the evaluation of the portfolio.

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<sup>29</sup> The Order further states: "Recommendations of the SAG to the Commission regarding application of this framework shall be submitted with adequate time for Commission review. If the SAG is not in unanimous agreement in its recommendation, the Commission requests that any recommendation that has the support of more than a majority of SAG members be submitted to the Commission along with a discussion and enumeration of the dissenting opinions." Docket No. 10-0568, Final Order at 72, December 21, 2010.

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