IMPACT AND PROCESS EVALUATION OF 2011 (PY4) AMEREN ILLINOIS COMPANY COMMERCIAL AND INDUSTRIAL STANDARD ENERGY EFFICIENCY PROGRAM

Final

Prepared for:

AMEREN ILLINOIS COMPANY

Prepared by:

OPINION DYNAMICS CORPORATION

1999 Harrison Street
Suite 1420
Oakland, CA 94612
(510) 444-5050

www.opiniondynamics.com

Contact: Mary Sutter, Vice President of Energy Evaluation

March 2013

THE CADMUS GROUP, INC.

NAVIGANT

Michaels engineering

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

1. EXECUTIVE SUMMARY

This report presents results from the evaluation of the fourth program year of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Standard Program for electric and gas energy efficiency. In Program Year 4 (PY4) (June 1, 2011 through May 31, 2012), AIC expected the Standard Program to account for 21% of the overall portfolio electric savings and 22% of portfolio therm savings. Savings from the Standard Program come from the core incentive offering, an Online Store where customers can buy energy efficient products at reduced prices, a Direct Install effort and a Green Nozzle offering.

As a result, the PY4 evaluation of the Standard Program was impact focused with limited process evaluation activity. 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, as well as site visits to assess large lighting projects. Our quantitative research efforts included a survey of participating contractors, a sample of those who utilized the Online Store, and an attempted census of customers who participated in the Core Standard Program and the Green Nozzle Offering.

Below we present the key findings from the PY4 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 1, the Online Store component had the lowest verification rate due mainly to the distribution of free lighting kits containing four CFLs and two LEDs. The team's research with these participants indicated that kit recipients had not installed a large portion of the bulbs mainly because they did not feel they were needed yet.[1]

Table 1. Standard Program Verification Results

Program Component	Program Tracking	Verified Participation	Verification Rate	Method
Core Program	2,553	2,541	100%	Participant Survey & Site Visits
Online Store	161,507	103,215	64%	Participant Survey & Database Review
Green Nozzle	902	817	91%	Participant Survey
Direct Install	18,678	18,678	100%	Database Review

Table 2 provides the PY4 Standard Program net impacts. In developing estimates of net savings, the team applied the PY2 Net-To-Gross Ratios (NTGRs) for all of the program's components. Overall, the PY4 Standard Program achieved 92,811 MWh in net electric savings and 1,560,266 therms in net gas savings. This level of savings enabled the program to exceed both its PY4 electric and gas goal.

[1] The team will give AIC credit for savings associated with the installation of these bulbs in subsequent program years.

Table 2. Standard Program Net Impacts

Program Component	Ex Ante Net			Ex Post Net		
	MWh	**MW**	**Therms**	**MWh**	**MW**	**Therms**
Core Program	50,847	10	405,994	51,454	11	458,325
Online Store	49,244	--	--	37,053	--	--
Direct Install	508	--	290,985	508	--	290,985
Green Nozzle	4,171	--	900,032	3,796	--	810,956
Total	**104,770**	**10**	**1,597,011**	**92,811**	**11**	**1,560,266**
	Net Realization Rate			*0.89*	*1.01*	*0.98*

Process Results

According to program staff, the Standard Program ran smoothly in PY4 and benefitted from the addition of staff resources to the marketing team. While program marketing was strong in prior program years despite a shortage of human resources, PY4 staffing changes have helped to alleviate previous staffing constraints caused by the need for staff in various roles across the program to assist with outreach activities.

Findings from our research with participating contractors also indicate that satisfaction with the program remains relatively high and that services provided by the Program Ally Network are generally valued by registered contractors. One potential exception is program-sponsored roundtables, which 21% of registered contractors said they saw as the least valuable service provided by the program when asked about a list of specific services.[2] Based on this feedback, program staff may want to collect additional data on this service in their annual Program Ally survey or through evaluation form filled out by event participants.

Based on the team's PY4 evaluation activities, we make the following recommendations for the program:

- **Update the assumed in-service rate for green nozzles**: The program should assume a removal rate of at least 10% (an overall installation rate of 90%) for the green nozzles distributed through the Standard Program. Research on this offering in PY2, found similar rates of installation, and as a result, the program included an installation rate of 82% in its PY3 tracking data.

- **Educate free lighting kit recipients about bulb replacement options**: Research with recipients of the PY4 free lighting kit indicate that many AIC customers request the kits, but hesitate to install the new bulbs in place of existing ones. As a result, while AIC held an LED webinar for customers in May 2012, program staff should also consider developing literature to accompany the bulbs that explains the benefits of replacing incandescent bulbs with CFLs or LEDs even if

[2] The team asked this question (P11) of all survey respondents and not just those who had taken advantage of each service listed. Due to survey length, we did not have an opportunity to gather feedback on potential improvements to specific services.

the existing bulbs are still operational. Additional information on LEDs and their use in commercial applications may also be helpful to customers given that a small number of survey respondents noted that they were unsure where to install LEDs or what the best application was for their business.

2. INTRODUCTION

This report presents results from the evaluation of the PY4 AIC C&I Standard Program. The Standard Program is one of three programs within the AIC Commercial and Industrial (C&I) portfolio, which also includes the Custom and Retro-Commissioning programs. In addition, under the umbrella of the Standard Program, AIC offers Green Nozzle, Direct Installation and Online Store initiative described in detail below.

To support the evaluation, we conducted research including a review of program materials and program-tracking data; interviews with program administrators, implementation staff, trade allies, and AIC Key Account Executives (KAEs); and site visits to assess lighting measure installation. Our quantitative research efforts included a telephone survey of those who participated in the Standard Core Program, as well as the Online Store and Green Nozzle program components.

2.1 PROGRAM DESCRIPTION

The C&I Standard Program offers AIC business customers fixed incentives for the installation of specific energy efficiency measures. The program covers lighting, variable frequency drives (VFDs), HVAC, refrigeration/grocery equipment, and motors. In addition, the program includes an online store available to all business customers that offers a variety of energy saving products, including Compact Fluorescent Lamps (CFLs), exit signs, and vending misers in a convenient and easy-to-use delivery mechanism. In addition, the program features two additional offerings:

- **Green Nozzle Program**: Beginning in PY4, the free green nozzles provided through this program effort were available to all AIC gas customers, as well as customers in the food service sector who use electric water heating. The goal of this effort is to replace less flow-efficient nozzles with low-flow green nozzles to reduce the therms associated with water heating. The effort targets eligible AIC restaurants, commercial kitchens, bar and grills, and other locations that perform food service/food preparation activities.

- **Direct Installation Initiative**: This initiative began as a PY3 pilot program to install faucet aerators and low-flow showerheads in facilities that previously received a green nozzle as part of the Green Nozzles Program, as well as hotels, motels, or restaurant facilities that belong to the GDS-2 rate class. In PY4, it expanded to electric customers and gas customers in the GDS-2 through GDS-4 rate classes, and offered a wider range of energy saving products including CFLs.

Overall, AIC designed and continues to modify the Standard Program to overcome barriers related to cost, awareness/information, and resistance to the adoption of new, more energy-efficient technologies. The incentives offered by the program address the cost of energy efficiency improvements; the recruitment of program allies; the establishment of a formal program ally network; and the development of program materials, including applications that are easy to understand and complete, that help overcome the awareness and information barrier. Further, those involved in program implementation use case studies, press releases, training sessions, and webinars as mechanisms to convince potential participants of the benefits associated with removing inefficient equipment even if it is still functional.

3. EVALUATION METHODS

3.1 DATA SOURCES AND ANALYTICAL METHODS

The assessment of the fourth program year of the AIC C&I Standard Program included both process and impact analyses. The team focused its PY4 evaluation activities on program impacts while including a limited process assessment. In addition, we gathered data to update the Net-to-Gross Ratio (NTGR) for the program for application in PY6. For PY4, we applied the NTGR from PY2 given that the program's implementation has remained relatively consistent, as has the NTGR for this program over the past three program years.

Table 3. Summary of Evaluation Methods

Activity	PY4 Impact	PY4 Process	Forward Looking	Details
Program Staff In-Depth Interviews*		√		Provides insight into program design, processes, and changes since PY3.
Marketing Staff In-Depth Interviews*		√		Provides insight into the impact of staffing changes and the addition of new marketing roles.
Program Ally Internet Survey*		√		Provides insight into the program ally experience and barriers to participation.
Core Program Participant Survey	√		√	Gathers data to assess installation rates for PY4 and NTG for PY6.
Green Nozzle Participant Survey	√		√	Gathers data to assess installation rates for PY4 and NTG for PY6.
Online Store Participant Survey	√		√	Gathers data to assess installation rates for PY4 and NTG for PY6.
Verification Site Visits	√			Confirms installation of lighting measures provided through the program.

*Conducted in conjunction with the Custom Program.

3.1.1 PROCESS ANALYSIS

The process analysis used data from two data collection methods: in-depth interviews and a quantitative Internet survey. In-depth interviews provided the team with a comprehensive understanding of changes in program design and implementation between PY3 and PY4. We performed these interviews in conjunction with the Custom Program evaluation and spoke with two program managers, the Large Industrial Sales Manager, one of two Program Ally Coordinators, the lead of the Marketing Team, and three Energy Advisors.

We also fielded an Internet survey with contractors active in the ActOnEnergy Program—both

registered Program Allies and non-registered participating contractors—to gather information about their experience with the program and its influence on their business over time.

3.1.2 IMPACT ANALYSIS

The impact analysis used data from both the quantitative telephone and Internet surveys of program participants, project files, and on-site verification visits. The participant surveys supported both the gross and net impact analysis while the project files and on-site visits were integral to the gross impact analysis.

In general, we applied the NTGR from PY2 to both gas and electric savings for this program given that the program's implementation has remained relatively consistent, as has the NTGR for this program over the past three program years.

Gross Impacts

To estimate PY4 ex-post gross savings, we used a combination of methods including the application of deemed savings, engineering review, and on-site verification visits. The following table summarizes the approach used for each component of the Standard Program.

Table 4. Standard Program Gross Impact Methods by Component

Program Component	Application of Deemed Savings	Engineering Review	On-Site Visits
Core Program	X	X	X
Online Store	X		
Direct Install Initiative	X		

The following sections provide additional details about each of the methods employed.

Engineering Review and Application of Deemed Savings

To determine gross impacts associated with the Core Standard Program, we conducted a review of the program-tracking database and applied deemed savings as outlined by the Illinois Commerce Commission in the Order for docket 10-0568. Engineers also used participant surveys to verify installation values. We supplemented this process with on-site visits (described below) for large lighting projects, as well as an engineering analysis for measures for which there were not deemed savings values (see Table 5).

Table 5. PY4 Measures Receiving Engineering Review

AIC Measure Code	Measure Name
BPH2	Gas Furnace Tune-Up
BPH1	Gas Boiler Tune-Up
BPC21	Air Conditioner Tune-Up
BPH3, BPH4	Gas Boiler Replacement
BPH5, BPH6, BPH7	Gas Furnace Replacement
BPM1, BPM1B	VFDs
BPL43	T12 to T5 New Fluorescent Fixture
BPL44	T8 to T5 Relamp and Reballast
BPL50	Exterior Lighting
BPL51	Canopy Lighting w/electronic ballasts

On-Site Verification Visits

For a sample of Core Standard Program sites that installed lighting measures, the evaluation team conducted on-site verification of measure installation. We chose to conduct on-site visits for these participants given the large number of measures installed and the difficulty of verifying those project details over the phone. As a result, for these sites, the team verified that the installed measure(s), for which the program participants received an incentive payment, is still installed and functioning, and that the quantity is consistent with the number of measures the utility paid on.

Net Impacts

The team applied the NTGR from PY2 to both the gas and electric programs. We provide information about the data collected to update the PY6 NTGR in Appendix C.

3.2 SAMPLING AND SURVEY COMPLETES

3.2.1 TELEPHONE SURVEYS

The evaluation team conducted quantitative telephone interviews with customers who participated in the Standard Program in PY4. These interviews focused on measure installation and NTG. We selected the sample of core participant projects from the AIC tracking system extract from August 20, 2012 and drew the sample of Green Nozzle participants from AIC Excel tracking files provided in June 2012. The team developed the Online Store sample based on data from Energy Federation (EFI) in July and August 2012. The following sections outline the sampling approach used for each survey effort.

Core Program Participant Survey

We developed the Standard survey sample based on a customer's measure end-use as opposed to their application type. As a result, grocery projects, for example, were classified as either refrigeration or lighting, but not as grocery.[3] This is because AIC characterizes completed projects in terms of application type (e.g., Standard Lighting or Standard Motor), as opposed to end-use. This means that a single application type could correspond to multiple end-uses. For example, a grocery application may contain lighting, refrigeration, or both.

In addition, we conducted sampling for the participant survey at the level of the project contact, rather than the project. This was necessary because as in previous program years, many customers completed more than one project in PY4. These businesses generally submitted the same contact name for different projects. As a result, to avoid respondent burden, we asked each contact about only one project. In total, the team identified 933 unique customer contacts for the Standard survey and the sample frame was based on these contacts.[4]

Since some of the questions in the survey were specific to projects (e.g., decision-making processes that led to the installation of the incented equipment), each contact with multiple projects was assigned a single project. If a contact had multiple projects of the same end use (e.g., lighting), we asked about the project with the largest savings. If a contact had projects that included different end uses, we asked about the largest non-lighting end use. This approach was intended to ensure that our sample would include a sufficient number of non-lighting projects, since lighting continued to be the predominant end use in PY4.

Based on the volume of lighting projects completed through the Standard Program, we also divided the sample frame into lighting and non-lighting components and stratified the lighting sample frame to identity the largest projects based on savings. We performed this stratification using the Dalenius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available interviews to the strata.

We then divided the resulting sample of contacts/projects into lighting and non-lighting projects. We obtained better precision on the lighting projects with fewer data points by stratifying according to expected energy savings. We further stratified the sample of lighting projects as follows: small savings—less than 50,000 kWh, medium savings—between 50,001 and 250,000 kWh, and large savings—greater than 250,001 kWh. As noted above, we performed this stratification using the Dalenius-Hodges method and the Neyman allocation. The following table outlines the stratification scheme implemented for this program.

[3] Those projects with multiple end-uses were assigned to the non-lighting end-use.

[4] Please note that the evaluation team also removed any participants who received a staffing grant in PY4. We chose to conduct separate interviews with these customers.

Table 6. Sample Design for Standard Lighting

Strata	kWh Savings Range	Number of Projects	Target Interviews	Completed Surveys
Small Lighting	0-25,000	756	18	41
Medium Lighting	25,001 – 250,000	347	53	46
Large Lighting	250,001-4,500,000	29	Census Attempt	10
Total [a]		**1,132** *		

[a] The stratification is based on project type as opposed to measure type, which results in a slight discrepancy between Table 6 and Table 7. A small number of grocery projects include lighting measures.

The purpose of stratifying the sample of lighting projects in particular is to ensure that the projects under study represent a sufficiently large proportion of lighting savings, so that savings-related results are representative of the population at a confidence of 90% and a precision level of 10%. To achieve this level of precision for lighting projects, we attempted a census of the largest projects and a random sample of the smaller-size projects. For non-lighting projects, we attempted a census via telephone. The following table presents the population values and survey information for the Core Standard Program.

Table 7. Completed Core Standard Program Survey Points

Measure Type	Database Population				Completed Surveys		
	Projects	Contacts	kWh Savings	Therm Savings	Contacts	kWh Savings	Therms
Lighting [a]	1,188	670	47,374,362	--	97	12,736,730	--
HVAC	167	126	1,804,764	86,867	46	41,111	21,742
Motor	58	50	18,963,225	--	19	33,137	--
Refrigeration	79	37	2,381,444	--	9	831	--
Water Heater	42	34	--	40,437	21	--	20,063
Steam Trap	17	9	--	373,624	1	--	11,905
Commercial Kitchen	7	6	68,780	6,564	2	258	1,464
Agriculture	2	1	28,001	--	--	--	--
Total	**1,560**	**933**	**70,620,576**	**507,492**	**195**	**12,812,067**	**55,174**

[a] In a small number of cases (primarily with grocery projects), there is a discrepancy between the measure type and project type because the project comprises multiple end-uses.

We used the survey to verify the installation of program measures and gather data to support the estimation of NTG. This sample design provides statistically valid impact results at the 90% confidence level +/- 1% precision for the Standard lighting projects on a kWh basis. For all other project types, we attempted a census and, therefore, there is no sampling error.

Survey Dispositions and Response Rate

We fielded the survey with Standard Program participants from August 29 through September 17, 2012. Table 8 provides the final survey dispositions.

Table 8. Standard Program Survey Dispositions

Disposition	N
Completed Interviews (I)	195
Eligible Non-Interviews	282
Mid-Interview terminate (R)	24
Respondent never available (NC)	168
Language Problem (NC)	1
Not Eligible (e)	64
Duplicate number	1
Fax/Data Line	9
Non-Working	29
Wrong Number	22
Business/Government	1
No Eligible Respondent	2
Unknown Eligibility Non-Interview (U)	351
Not dialed/worked	259
No Answer	23
Answering Machine	67
Busy	2
Total Participants in Sample	**892**

The following table provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates.

Table 9. Standard Program Survey Response and Cooperation Rates

AAPOR Rate	Percentage
Response Rate	25%
Cooperation Rate	63%

Green Nozzle Participant Survey

We conducted a quantitative telephone survey with customers who have participated in the Green Nozzle Program in PY4 and focused the interviews on measure installation and NTG. We drew our sample from the Excel program-tracking data files provided by the program implementer. As part of the cleaning process, the team removed participants who received nozzles outside of PY4 and those with bad or missing phone numbers. In addition, some businesses had nozzles installed at many different locations, but shared the same contact, the same phone number, or the same account number and therefore were not included. As a result, the final sample frame was based on unique participants with valid contact information (68% of the population).

Table 10 below presents information about the completed surveys and sample.

Table 10. Completed Green Nozzle Survey Points

Program Component	Database Population	Sample Frame	Completed Surveys
Green Nozzle	756	514	101

Overall, we reached participants associated with 13% of the program savings. Given that we attempted a census of all unique participants, there is no sampling error associated with our estimates.

Survey Dispositions and Response Rate

We fielded the survey with Green Nozzle participants from July 31 through August 6, 2012. Table 11 provides the final survey dispositions.

Table 11. Green Nozzle Survey Dispositions

Disposition	N
Completed Interviews (I)	101
Eligible Non-Interviews	245
Refusals (R)	59
Mid-Interview terminate (R)	2
Respondent never available (NC)	183
Language Problem (NC)	1
Not Eligible (e)	33
Fax/Data Line	5
Non-Working	17
Wrong Number	5
Business/Government	1
No Eligible Respondent	5
Unknown Eligibility Non-Interview (U)	135
Not dialed/worked	77
No Answer	22
Answering Machine	33
Busy	3
Total Participants in Sample	**514**

The following table provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates.

Table 12. Green Nozzle Survey Response and Cooperation Rate

AAPOR Rate	Percentage
Response Rate	22%

AAPOR Rate	Percentage
Cooperation Rate	62%

3.2.2 INTERNET SURVEYS

Program Ally Internet Survey

The Internet survey with participating AIC contractors, which includes registered contractors (or program allies) and non-registered contractors, focused on program participation, satisfaction, barriers to participation among eligible AIC business customers, and the impact of program participation on the program ally business and business practices. We sent an invitation to participate in the survey to all 907 participating contractors with valid email addresses, as well as follow-up reminders.

Table 13. Completed Program Ally Survey Points

	Population	Sample Frame	Completed Interviews
Participating Contractors	991	907	49
Registered Contractors	*573*	*569*	*35*
Non-registered Contractors	*418*	*338*	*14*

The evaluation team concluded that an un-weighted analysis of the registered and non-registered contractor data provided the best representation for process results given that no sampling took place. The analysis largely features the reporting of response frequencies, and we decided to give equal weight to each response.

Survey Dispositions and Response Rate

The survey with participating contractors was fielded from August 14 - September 9, 2012. Table 14 presents the sample disposition.

Table 14. Program Ally Online Survey Dispositions and Response Rate

Disposition	N
Total Emails Sent	907
Completes (may include partials used in analysis)	49
Bounce Backs	114
No Response	751
Eligible (907-114)	**793**
Response Rate (Completes/Eligible)	**6.2%**

Appendix B provides information on the methodology used to calculate response rates.

Online Store Participant Survey

The evaluation team conducted a quantitative Internet survey with customers who purchased products through the online store in PY4 and had a valid email address. The survey focused on measure

installation, as well as free ridership and spillover. We conducted the survey with a sample of participating customers drawn from EFI invoice data files received and downloaded on July 17, 2012. Records for the free lighting kit (4 CFL/2 LED packs), which were distributed through a coupon offer, were received separately from AIC on August 27, 2012.[5] Unfortunately, the team did not have all available data for customers who received free CFL 6-packs—a carryover offer from PY3 that was not continued throughout PY4—at the time the survey sample was developed. As a result, while they are included below as part of the population, a portion of free CFL 6-pack recipients was not included in the sample frame.

Table 15 below presents the distribution of respondents across various measure categories in the survey population, sample frame, and across the completed interviews. The sample frame represents customer records that contained a valid unique email address, and were unique representations of online store accounts.[6] It is also important to note that a single respondent can appear more than once in the table, as he or she could have purchased more than one product. Finally, as shown in the table below, the sample of completed interviews closely resembles the sample frame.

Table 15. Completed Online Store Survey Points

Product Type	Population		Sample		Completed Surveys	
	#	%	#	%	#	%
Free Kit (4 CFLs/2 LEDs)	22,042	89.50%	2,522	73.44%	178	82.79%
Free CFLs (3-pack)	81	0.33%	45	1.31%	1	0.47%
Free CFLs (6-packs)	1,703	6.91%	64	1.86%	1	0.47%
LED downlights	5	0.02%	5	0.15%	0	0.00%
LED exit signs	196	0.80%	196	5.71%	8	3.72%
LED exit sign bulbs	38	0.15%	38	1.11%	0	0.00%
Motion sensors	86	0.35%	86	2.50%	1	0.47%
Specialty CFLs	99	0.40%	164	4.78%	6	2.79%
Spiral CFLs	164	0.67%	99	2.88%	8	3.72%
T8 ballasts	70	0.28%	70	2.04%	0	0.00%
T8 lamps	35	0.14%	35	1.02%	0	0.00%
Vending controls	21	0.09%	21	0.61%	1	0.47%
LED lights	83	0.34%	83	2.42%	9	4.19%
Total*	**24,623**		**3,428**		**213**	

[5] The team did not have all available data for customers who received free CFL 6-packs—a carryover offer from PY3 that was not continued throughout PY4—at the time the survey sample was developed.

[6] A full listing of all measures distributed through the online store can be found in Table 19.

* Note that a single respondent can appear more than once in the table, as he/she could have purchased more than one product.

Survey Dispositions and Response Rate

We fielded the survey with participating customers between August 29 and September 21, 2012. It is important to note that the total number of emails sent does not match the table above given that a customer may have purchased more than one product. For example, if one customer purchased both Spiral CFLs and LED lights, they would count as one respondent, but be counted twice (once for both measures) for the purposes of sampling.

Table 16. Online Store Survey Dispositions

Disposition	N
Total Emails Sent (to unique customers)	2,809
Completes (product level)	183
Bounce Backs	424
Refused (replied but refused)	2
No Response	2,194
Eligible (2,809-424)	**2,385**
Response Rate (Completes/Eligible)	**7.7%**

3.2.3 ON-SITE VERIFICATION

The evaluation team selected a sample of 40 large lighting projects for site verification. In particular, we drew our sample from a sample frame containing all lighting projects with ex ante savings of 50,000 kWh or more. We chose the sample using a stratified random sampling design employing the Dalenius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available visits to the strata. We based the sample on the AIB database extract provided on June 21, 2012.

The following table summarizes the sample selected and the total number of sites we visited.

Table 17. Lighting Verification Site Visit Sampling Approach

Sampling Strata	KWh Savings Range	Number of Projects	Site Visit Sample	Site Visits Completed
1	50,000-100,000	95	6	7
2	100,001 – 500,000	62	28	28
3	More than 500,000	6	6	6
Total		**163**	**40**	**41**

The final sample design provides statistically valid verification results at the 90% confidence level +/- 1% on a kWh basis. To calculate relative precision, the team first determined the variance in the sample and then calculated the standard error and confidence interval. The figure below outlines the equations used.

Figure 1. Equation for Calculating Precision

$$standard\ error = \sqrt{variance}$$

$$90\%\ Confidence\ Interval = 1.645 * standard\ error$$

$$Relative\ Precision = \frac{Confidence\ Interval}{\hat{R}}$$

4. RESULTS AND FINDINGS

4.1 PROCESS FINDINGS

The evaluation team performed a targeted process evaluation of the PY4 program focusing mainly on program marketing and outreach, as well as associated program implementation changes in this area. Results are based on in-depth interviews with program staff, a detailed review of the program marketing and implementation plans, and an Internet survey with participating contractors.

4.1.1 PROGRAM PARTICIPATION

The number of Standard projects remained consistent with PY3 participation levels (1,557 and 1,560 projects, respectively). As in PY3, lighting remained the dominant end use for the Standard Program, comprising almost three quarters of all projects. In addition, the program introduced two new gas measures: steam traps and water heaters.

Table 18. Overview of PY4 Core Standard Program Participation

Project Type	PY4 Total Projects	
	Number	Percent
Lighting	1,132	73%
HVAC	208	13%
Grocery	128	8%
Motor	58	4%
Commercial Kitchen	11	1%
Steam Trap	17	1%
Lodging	4	>1%
Agriculture	2	>1%
Total	**1,560**	**100%**

PY4 Data Source: AIB Extract as of August 20, 2012.

A smaller number of customers participated in one of the Standard Program's auxiliary efforts such as the Green Nozzle or Direct Installation offering. In total, the program saw 756 participants in the Green Nozzle effort and 1,272 in the Direct Install effort.[7]

Online Store Participants

Online Store participants are AIC customers who either purchased products through the ActOnEnergy Online Store or responded to a promotional offer by mailing in a coupon for free CFL and LED bulbs. Here we refer to both as participants.

Similar to PY3, the majority of online store savings in PY4 are a result of a free lighting coupon offer, where customers could fill out a coupon and receive up to four CFLs and two LEDs for free. In some cases, AIC customers received six or three free CFLs as a result of promotions at the end of PY3 that carried into PY4. Table 19 below shows the number of units distributed or sold in PY4 compared to PY3. While the volume has increased dramatically, the mix of products and their relative contribution to sales has remained relatively constant.

Table 19. Online Store Purchases (in Units) across Program Years

Product Type	PY3		PY4	
	Number of Units	Percent of Units	Number of Units	Percent of Units
Spiral CFLs – Free [a]	17,717	63%	32,237	64%
Spiral CFLs – Paid	6,018	21%	10,061	20%
Specialty CFLs	1,704	6%	2,490	5%
T8 ballasts	1,178	4%	2,668	5%
LED exit signs	942	3%	1,459	3%
Motion sensors	390	1%	545	1%
LED exit sign retrofit kits	170	1%	208	0%
Vending controls	110	> 1%	66	> 1%
LED lights	26	> 1%	915	2%
LED downlights	20	> 1%	10	> 1%
T8 lamps	19	> 1%	91	> 1%
Total	**10,577**		**50,750**	

[a] This includes multiple separate offers, such as CFL packs offered online, through a legacy mail offer, or through direct install, as well as the PY4 offer of a free 4 CFL/2 LED pack.

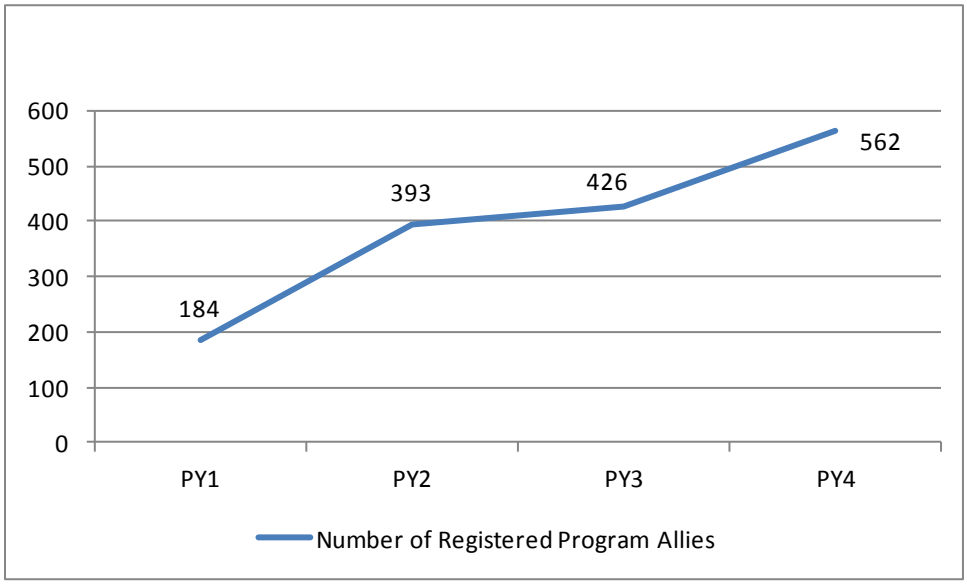
[7] Unique participants based on account number.

It is important to note that AIC also orders products through the Online Store for dissemination among contractors supporting the Direct Install effort. Those products are not included in the counts presented above.

Program Allies

The ActOnEnergy Business Program provides participating contractors with the opportunity to register formally with the program. In doing so, the contractors become "Program Allies" and members of the ActOnEnergy Program Ally Network. In PY4, the program added 136 allies bringing the total number of program allies to 562. Program staff was pleasantly surprised with the number of allies added in PY4 given their belief that recent outreach to contractors had gone well and there were few additional contractors who did not know about the program. As shown in Figure 2, the Program Ally Network has grown consistently since the program's inception.

Figure 2. Program Ally Network Growth



4.1.2 PROGRAM DESIGN AND IMPLEMENTATION

Based on interviews with program staff, the C&I Standard Program continued to function smoothly and effectively in PY4. With the addition of new staff members, particularly in the marketing area, the program was also able to continue its strong outreach efforts to potential participants. A hallmark of prior years, the program continued to implement promotional efforts aimed at generating participation in specific areas of the program. The following sections provide details on key program changes in PY4.

Acquisition of Additional Staff Resources

In PY4, the ActOnEnergy Business Program underwent significant staff changes. In particular, the program expanded its marketing team by hiring six Energy Advisors, two Segment Coordinators, one Education and Training coordinator, two Program Ally Coordinators, one Material and Web coordinator, and a Chain Account Coordinator to join the marketing team. Below we describe the roles

and responsibilities of the new staff:

- **Energy Advisors.** The role of AIC's Energy Advisors is to perform customer outreach, as well as serve as a point-of-contact for customer service. There are seven Energy Advisors and each is responsible for a specific geographic region within the AIC service territory. Typical activities include cold-calling potential customers, traveling to both scheduled and cold customer meetings, working with customers to identify eligible projects for program incentives, connecting customers with program allies, and guiding customers through the application process as needed. These duties intersect with the other marketing staff, most frequently with Program Ally Coordinators, as well as Market Segment coordinators.
- **Segment Coordinators.** This group focuses on building relationships with organizations or other entities that represent the segments that the program targets (e.g., the Chamber of Commerce). The coordinators promote the program to these groups through presentations, lunch and learns, and informational breakfasts. While the program has existing relationships with many of these organizations because of efforts in prior program years, the addition of dedicated staff in this area has allowed the program to expand these relationships as well as cultivate new relationships.
- **Education and Training Staff.** The addition of a dedicated Education and Training staff member in PY4 allowed the program to further develop its education and training offerings. The Education and Training Coordinator focuses much of their time on coordinating webinars and making training material available online, as these strategies have been effective in the past. In addition, they also offer live training such as Certified Energy Manager training. The training events are offered to both trade allies and customers.
- **Program Ally Coordinators.** This group recruits new trade allies through cold calling, presentations, and attendance at symposiums and trade shows. Notably, the program recruited 136 new trade allies in PY4, substantially more than the previous year. The coordinators also reach out to existing trade allies to keep them informed of program offerings.
- **Web and Materials Coordinator**. The Web and Materials Coordinator focuses on developing materials such as direct mailings, web advertisements, and emails. A major focus in PY4 was tailoring the materials to the appropriate target audience.
- **Chain Account Coordinator**. This staff person is responsible for implementing the ActOnEnergy strategy for national chain accounts and vendors and acting as the common SAIC voice with all national chain accounts across the country.

In addition to these implementation staff members, AIC KAEs continue to help secure and facilitate relationships with the largest AIC customers as in prior years. KAEs can also facilitate leads for the Energy Advisors by helping to identify decision-makers at AIC customer facilities.

Further, there is frequent cooperation among most members of the marketing team, although few of the staff members with whom we spoke worked with the Chain Account Coordinator in PY4. In general, coordination among team members occurs on an as-needed basis when responsibilities for a given effort run across marketing roles. The following are examples of how the team interacts and communicates:

- Energy Advisors meet with each other on a bi-weekly basis to discuss progress towards

program goals, program changes, successful strategies, and potential opportunities.

- KAEs and Energy Advisors work together to guide interested customers through the program participation process.
- Market Segment Coordinators often ask Energy Advisors or one of the Program Ally Coordinators to co-present at seminars or meetings with Chambers of Commerce.

Those interviewed feel that the current program structure is effective. Each staff person interviewed was relatively new to the program, but each had the impression that the program experience has improved for both customers and AIC staff. They felt that having additional staff assigned to well-defined roles was important to the success of the marketing team. When the responsibilities of each marketing staff person are well defined, it is easy to identify and contact the relevant expert, and each staff person is clear about their role and their own set of goals within the program. Furthermore, by organizing contacts by geographic region rather than industry sector, the program has facilitated the staff's ability to visit customers in person, which is very effective for both finding energy saving opportunities and motivating participation.

4.1.3 MARKETING AND OUTREACH

Overview of Marketing and Outreach Activities

Marketing and outreach efforts continue to be of critical importance to the Standard Program and business portfolio overall given sharply increasing savings goals and the launch of the first official year of gas programming. For the business portfolio overall, the electric savings goal increased 20% over PY3 and the gas goal increased by 40%.

Drawing upon its expanded marketing team, AIC continued to strengthen its marketing and outreach efforts in PY4. Overall, as illustrated in Figure 3, program marketing and outreach strategies were diverse and well rounded.

Figure 3. Marketing and Outreach Activities

While many of the tactics utilized in PY4 are consistent with those employed in the past, it is worth noting changes in the following areas:

- **Program Ally Communication**. Given that program allies are another channel through which AIC customers learn about the Standard Program, outreach to this group by the program implementer, as well as the level of promotion that program allies conduct themselves, is central to program growth. The program staff that we interviewed believed that the ActOnEnergy Program is being effectively marketed to program allies. In particular, efforts in this area include educational webinars and training events, new program ally recruitment efforts, emails, direct mail, newsletters, and in-person meetings. While many of these activities are consistent with prior program years, the addition of Program Ally Coordinators enhanced what the program could achieve in this area.
- **Program Promotions**: Similar to PY3, the program used a series of promotional efforts to generate interest and participation in the Standard Program. As shown in the table below, the program continued offering bonuses to customers for lighting products that will be phased out, and for engaging with the program through events such as the symposiums held in PY4.

Table 20. PY4 Customer Promotional Efforts

Promotion	Timing	Description
T-12 Ramp Down	April 2012	Announcement regarding the 10% bonus on T-12s
Symposium Coupon Bonus	May 2012	A bonus of 15% for customers who participated in a symposium sponsored by the program.

Promotion	Timing	Description
Online Store Reduced Pricing	May through August 2011	Extended offer for two free 3-packs of CFLs, a promotion launched in PY3.
T12 Ramp-Down and Early Completion Coupon	October 2011	The program extended the existing T12 ramp-down bonus and added a coupon for customers who completed projects early.
New Lighting Incentive	December 2011	An update to the lighting application affecting BPL44, 45, 50, and 91. LED incentive added (BPL67).

4.1.4 PROGRAM PROCESSES

Program Ally Participation

To understand the context in which participating contractors interact with the program and market their services, we asked respondents whether the majority of the services they provide relate to preventative maintenance or fix on failure. In general, we found an even split between those performing each type of work.

Table 21. Description of Contractor Services

Most of the services your company provides are…?	Percent of Contractors (n=49)
Preventative maintenance	51%
Fix on failure	49%

The team also found that registered and non-registered contractors employ a similar set of promotional strategies, the most prevalent of which are customer referrals and word of mouth advertising. However, registered contractors are more than twice as likely as non-registered contractors to use online advertising (66% and 21%, respectively). This finding suggests that registered contractors have different strategies and interests when it comes to marketing their services and the ActOnEnergy Program. Furthermore, while some registered contractors may have a clear desire to take advantage of co-branding opportunities, for example, this benefit may not be a critical factor for all contractors.

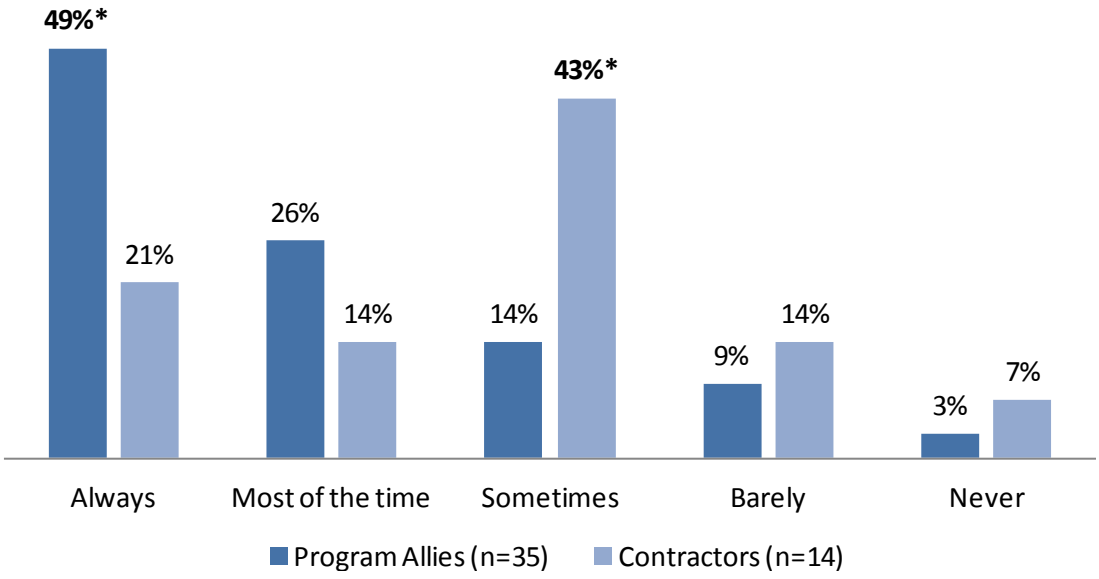
Table 22. Participating Contractor Promotional Strategies (Multiple Response)

Promotional Strategies	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Customer Referrals	91%	100%
Word of Mouth	91%	86%
Online Advertising	66%*	21%
Print Advertising	46%	29%

* Indicates significance at 90% confidence level.

In terms of the frequency with which program marketing takes place, within the past six months, 63% of all participating contractors report promoting the program either "always" or "most of the time." Registered contractors are also much more likely than non-registered contractors to promote the ActOnEnergy Program. As shown in Figure 4, almost half of the registered contractors we interviewed promoted the program all of the time, whereas the greatest share of non-registered contractors (43%) promoted the program some of the time.

Figure 4. Frequency of Program Promotion in the Past 6 Months



* Indicates significance at 90% confidence level.

Additionally, contractors perceive moderate levels of program awareness. In particular, most contractors (69%) report that their customers are "somewhat aware" of the program, while 20% reported that their customers are "very aware."

Table 23. Customer Awareness of the ActOnEnergy Program

Awareness	All Contractors (n=49)
Very aware	20%
Somewhat aware	69%
Not at all aware	10%

In an effort to assess the degree to which registered contractors leverage AIC marketing materials and co-branding opportunities, the team asked about their receipt and use of program materials, as well as their value in marketing the program.

Overall, less than half (46%) of registered contractors reported that they had received some marketing materials from the program. Among those who did receive materials, 29% received print materials, 11% received online materials, and 9% received some other type of marketing material. In addition, over two-thirds (69%) of those who received marketing materials used them to promote the program, and of those who used them, the majority (64%) found them to be useful (a rating of 8-10 on a scale from 0 to 10 where 0 is "Not useful at all" and 10 is "very useful."

Table 24. Usefulness of Program Marketing Materials among Those Using Them

Usefulness of Program Marketing Materials	Mean Rating
Registered contractors using materials (n=11)	7.5

Note: Scale from 0 to 10 where 0 is "Not useful at all" and 10 is "very useful."

While we also attempted to gather feedback on the availability of co-branding opportunities, only a small number of registered contractor respondents had produced co-branded materials (n=5). However, three of the five respondents rated the importance of co-branding to their company's marketing efforts a 10 on a scale from 0 to 10 where 0 is "not at all important" and 10 is "very important."

Registered contractors reported making a few changes to their marketing practices as a result of becoming an ally. One-fifth (20%) verbally recommended the program to their customers, 14% said they used the program logo on print marketing materials, and 9% said that they performed co-branding or advertising with affiliated businesses.

Benefits of Membership in the Program Ally Network

Program Allies identified the ability to offer customers incentives and rebates as the greatest benefit of registering as an ally (cited by 26% of program allies). Other perceived benefits include that being registered with the program increases the legitimacy of the contractor's business (23%), that the contractor's status as a program ally can be used as a selling point with customers (17%), and that there is increased visibility that results from partnering with AIC and being listed on their website (14%).

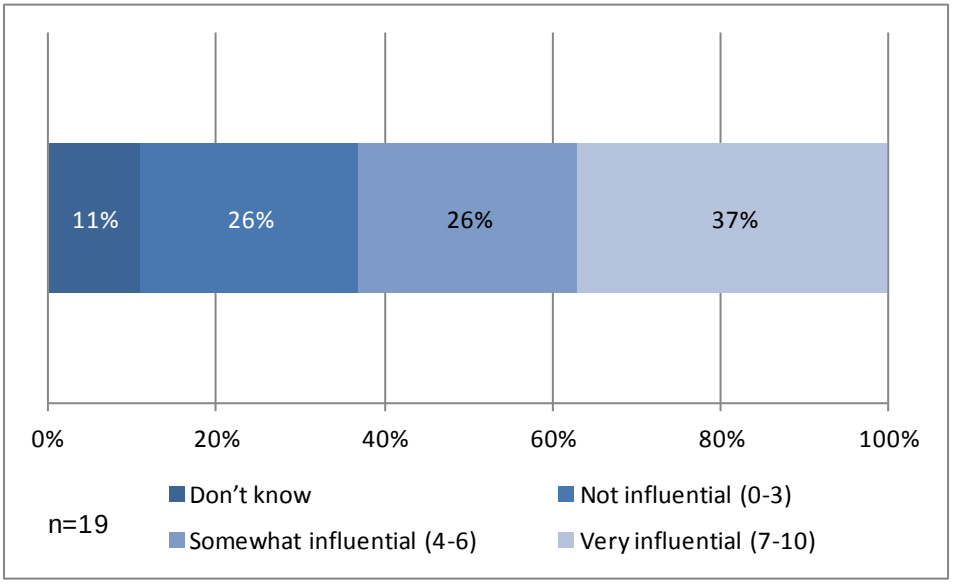
Table 25. Main Benefits of Program Ally Participation

Benefit	Percentage of Program Allies (n=35)
Able to offer customers incentives/rebates	26%
Increases legitimacy/credibility of business	23%
Selling point with potential clients/increased sales	17%
Association with Ameren/listed on program website	14%
Getting updates on latest rebate/program opportunities	14%
Able to offer customers EE equipment/save them energy	11%
Opportunities for new business	9%
Shows social responsibility/helping the environment	9%

The team also asked registered program allies which of the services provided by the program are of least value to them. While 14% of respondents said all of the services had value, program-sponsored roundtables ranked highest in the list of least valuable program services (cited by 21% of allies), followed by email blasts (18%) and webinars (15%).

In general, respondents were knowledgeable of the bonus offers initiated by the program in PY4. For example, almost three quarters of all respondents (71%) were aware of the bonus offers. However, eligible program allies had mixed opinions on how much the bonus offer influenced the number of projects they submitted in PY4. As shown in the table below, just over a third thought that it was very influential (37%), while just under a third thought it was somewhat influential (26%) or not influential (26%). The overall mean rating was 5.4. These ratings may reflect the fact that many bonus offers were linked to specific program measures or offerings that not all allies would be exposed to or involved in.

Figure 5. Impact of Program Ally Bonus Offers



Note: Scale is from 0 to 10 where 0 is "Not influential at all" and 10 is "very influential."

Program Ally and Contractor Satisfaction

Overall, participating contractors are satisfied with the program. As shown in Table 26, satisfaction with the application process was slightly higher among non-registered contractors (mean score of 7.4 vs. 6.0 for registered contractors) and the highest satisfaction score was for communication with ActOnEnergy program staff (8.1 for registered contractors and 8.6 for non-registered contractors).

Table 26. Participating Contractor Mean Satisfaction Scores

Program Component	Overall Mean Score (n=49)	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Communication with ActOnEnergy Staff	8.2	8.1	8.6
The measures offered	7.9	7.8	8.1
The incentive amounts	7.7	7.5	8.0
The ActOnEnergy Program in general	7.6	7.5	8.1
The application process	6.5	6.0	7.4*

Note: Scale is from 0 to 10 where 0 is "very dissatisfied" and 10 is "very satisfied."
* Indicates that contractor mean is significantly higher than registered program ally mean at 90% confidence level.

We followed up with respondents who indicated that they were dissatisfied with the program in general. We attributed dissatisfaction with the program mainly to the application process being too long, complicated, or unclear (cited by 10 of the 16 contractors who indicated dissatisfaction with some element of the program).[8] Some program allies and contractors also felt that they lacked access to updated or accurate information about the program (25%), and one quarter (25%) of those who were dissatisfied felt that the incentives should be higher. Finally, three registered program allies felt that is was difficult to get assistance from AIC.

Some of these areas of dissatisfaction are also reflected in suggestions for program improvement. For example, as show in Table 27, 20% of contractor respondents recommended that the program simplify the application process or offer an online application. A small percentage (12%) suggested that AIC improve communication despite the fact that this component of the program received the highest satisfaction ratings.

Table 27. Contractor Recommendations for Program Improvement

Recommendations	All Respondents (n=49)
Simplify application process/allow online applications	20%
Improve AIC communication/customer support	12%

[8] The team understands that AIC has modified the application in PY5 and is working towards providing an auto-submit feature.

Recommendations	All Respondents (n=49)
Reduce or change program requirements	12%
Provide more accurate program information/estimates	12%
Higher incentives rebates	10%
More program advertising	10%

Barriers to Customer Participation

Most participating contractors (73%) report that their customers are "somewhat aware" of the option to make their facilities more energy efficient, while 22% report that their customers are "very aware" and 4% report that they are "not at all aware."

Table 28. Customer Awareness of Energy Efficiency Options

Awareness	All Respondents (n=49)
Very aware	22%
Somewhat aware	73%
Not at all aware	4%

The greatest barrier that participating contractors face in encouraging customer participation is related to customer budget constraints, although non-registered contractors are more likely than registered contractors to report this as a barrier to their customers' participation (86% vs. 57%). A lack of upfront capital and a minimum required return on investment also posed significant barriers for non-registered contractor customers. Some non-registered contractors suggested that the best way to overcome these barriers would be through offering financing options to reduce the upfront capital needed for a project, or by offering a higher incentive. However, due to legislative and regulatory orders, AIC is unable to offer financing to business customers.

Table 29. Contractor Perceived Barriers to Customer Participation

Perceived Barriers to Customer Participation	Percent of all Respondents (n=49)	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Budget constraints	65%	57%	86%*
Lack of upfront capital for projects	54%	54%	57%
Minimum return on investment	37%	37%	29%
Awareness of programs	31%	26%	43%
Financial viability of the project	27%	29%	21%
Customer staffing issues	8%	9%	7%
Energy efficiency not a high priority	4%	6%	-

* Indicates that contractor percentage is significantly higher than registered program ally percentage at 90% confidence level.

Program Influence of Contractor Business Practices

Overall, contractor respondents indicate that the ActOnEnergy Business Program is having a positive effect on their sales of energy efficient equipment. More than half of respondents (59%) report that their businesses' sales of energy efficient equipment have increased in the past 12 months. When asked how important the ActOnEnergy Program was in this increase (as compared to the importance of other factors such as tax credits, government rebates, or changes in codes and standards), respondents rated the importance of the ActOnEnergy Program higher than these other factors (mean importance rating of 7.6 and 5.7, respectively).

Table 30. Program Influence on Changes in Energy Efficient Equipment Sales

Contractors	Percentage reporting an increase	Mean Program Importance	Mean Importance of Other Factors*
Registered (n=35)	63%	7.6	5.4
Non-Registered (n=14)	50%	7.7	6.4
All Respondents (n=49)	**59%**	**7.6**	**5.7**

Note: Mean influence scores on a scale from 0 to 10 where 0 is "not at all important" and 10 is "very important."

*Other factors could include tax credits, government rebates, changes in codes and standards, and a greater awareness of energy efficiency in general, etc.

Most program allies also reported that the program had an effect on their business more generally. Most commonly, program allies reported that they focused their marketing efforts on energy efficiency (57%). Almost a third (29%) thought the program had an effect on the type of equipment they sold. Although very few opened new offices (3%), a few (14%) were able to hire new staff because of the program.

Table 31. Program Impacts on Program Ally Business Practices

Impact on Program Ally	Percentage of Program Allies (n=35)
Focused marketing on energy efficiency	57%
Changed the type of equipment sold	29%
Hired more staff	14%
Opened new offices	3%

4.2 IMPACT RESULTS

4.2.1 PARTICIPANT VERIFICATION

We verified program participation for the Standard Program through a combination of database review, participant surveys, and on-site visits. Given its small contribution to program savings, we based verification of the Direct Install Initiative solely on our review of program-tracking data. For additional detail on the methodology used for each program component, please see Section 3.

Core Standard Program

Our participant verification activities for the Standard Program (excluding the Online Store, Green Nozzles, and Direct Install) yielded verified measure counts that differ only slightly from tracking database estimates.

Table 32. Core Standard Program Database and Survey Verification Results

Measure Type	Program-tracking Measure Count [a]	Verified Measure Count	Verification Rate[b]
Lighting	2,079	2,067	99.4%
HVAC	203	203	100%
Motor	65	65	100%
Refrigeration	114	114	100%
Water Heater	47	47	100%
Steam Trap	34	34	100%
Kitchen	9	9	100%
Agriculture	2	2	100%
Total	**2,553**	**2,541**	**99.5%**

[a] Please note that the number presented here is a count of the project IDs and associated measures within each of these categories as opposed to the number of units per measure or measure quantity.

[b] The verification rate is based on a combination of site visit and survey data.

Online Store

We provide the following measure verification results based on our review of the program-tracking data, as well as a survey with customers who purchased products through the Online Store or requested a free lighting kit via mail. As noted in the table below, AIC claims savings for a select number of Direct Install (DI) measures that the implementer purchases through the Online Store for distribution to contractors participating in the DI effort.[9]

[9] Please note that these measures were not included in the summary of Online Store orders presented in Table 19.

Table 33. Online Store Verification Results

Measure Type	Program Tracking No. of Units	Verified No. of Units	Verification Rate	Verification Source [b]
LED Downlight	10	10	100%	Database review [a]
LED Exit Sign	1,514	1,515	100%	
Online Store	*1,457*	*1,459*	*100%*	
Direct Install	*57*	*56*	*98%*	
Motion Sensor	545	545	100%	
Specialty CFL	2,443	2,490	102%	
Spiral CFL	10,092	10,061	100%	
T8 Ballast	2,588	2,668	103%	
T8 Lamp	29	91	314%	
Vending Control	66	66	100%	
LED Lights	905	915	101%	
LED Exit Sign Light Bulbs	672	679	101%	
Online Store	*202*	*208*	*103%*	
Direct Install	*470*	*471*	*100%*	
6 Free CFLs	10,225	10,192	100%	
Online Store	*10,057*	*10,024*	*100%*	
Direct Install	*168*	*168*	*100%*	
3 Free CFLs	166	172	104%	
Free Lighting *Kit (22,042 kits)*				Participant Survey
Total CFLs	*88,168*	*53,782*	*61%*	
Total LEDs	*44,084*	*19,838*	*45%*	
Total	**161,507**	**103,024**	**64%**	

[a] Data Source: EFI Invoice files.

[b] The table contains verification data from two sources based on the number of respondents to the participant Internet survey and the distribution of responses by measure.

As illustrated in the table above, surveys with participating customers indicate that customers do not immediately install all of the CFL and LED bulbs received as part of the free lighting kit. When asked why bulbs had not been installed, the majority of customers said they were waiting for existing bulbs to burn out. In a small number of cases, recipients of LEDs noted that they had not found an appropriate location for the bulbs. We also asked those customers who had not installed all of their bulbs whether they planned to do so in the future. Based on these findings, the team calculated a PY5 and PY6 installation rate to account for the later installation of these bulbs. As part of these calculations, we

assumed a final installation rate of 98% as documented in the Statewide TRM for CFL bulbs.[10] Given that the TRM only provides an installation rate for LED light bulbs purchased by utility customers as opposed to those received free of charge, the team felt it was appropriate to use the 98% installation rate provided for CFLs. We made this determination after reviewing the survey data collected, which indicated installation rates far below 100%.

Table 34. Installation Rate for Free Lighting Items

Free Kit Measure	Installation Rate			
	Final	PY4	PY5	PY6
CFLs	98%	61%	22%	15%
LEDs	98%	45%	19%	34%

Green Nozzles

The evaluation team verified participation and installation rates through a review of the program-tracking data, as well as a participant survey. Based on this information, the team provides the following summary of green nozzle verification results.

Table 35. Green Nozzle Verification Results

Measure	Program Total (N)	Verified Units (Telephone Survey)	Verification Rate
Green Nozzle	960	125/138	91%

Note: The verification rate is based on survey research with participating customers.

In particular, we used a battery of questions in the participant survey to determine the in-service rate, or the percentage of green nozzles that are still installed and operating. As shown in Table 35, the verification for this measure is relatively high. It is also important to note that this represents an increase over the installation rate determined in PY2, which was 82%.[11]

Through our survey, we found that four of the six respondents who removed their green nozzle did so within a month of installation, while an additional two respondents did so between two to six months of installation. The reasons provided by participants as to why they removed the measure include that they did not find it as effective at rinsing dishes, and that they were not able to install the nozzle so that it functioned properly.

[10] We acknowledge this overall installation rate is associated with the residential sector. However, we have applied it here given the lack of data on the commercial sector.

[11] Opinion Dynamics. "Impact and Process Evaluation of 2009 (PY2) Ameren Illinois Green Nozzles Program." October 2010.

In general, the trend among those who removed the nozzles provided through the program is to re-install their previous pre-rinse spray nozzle. For example, five of the six respondents who removed the green nozzle replaced it with their old nozzle. Only one replaced it with a new nozzle.

Direct Install Initiative

The evaluation team verified program participation through a review of the program-tracking data. Our verified results match the tracking data exactly as illustrated in Table 36 below.

Table 36. Direct Install Verification Results

Measure	Program-tracking No. of Units	Verified Units	Verification Rate
Faucet Aerators – Kitchen	1,415	1,415	100%
Faucet Aerators – Bath/Office	17,073	17,073	100%
Shower Head	142	142	100%
Pipe Insulation	48	48	100%
Total	**18,678**	**18,678**	**100%**

Note: The verification rate is based on database review.

4.2.2 GROSS IMPACTS

Core Standard Program

Our impact analysis activities for the Standard Program yielded ex post gross electric energy savings and peak kW impacts that are approximately equal to ex ante estimates, as well as ex post gross gas energy savings that are higher than the ex ante estimates.

Table 37. Core Standard Program Gross Impacts

Measure Type	Verified Measures	Ex Ante Gross			Ex Post Gross			Realization Rate		
		kWh	kW	Therm	kWh	kW	Therm	kWh	kW	Therm
Lighting	2,067	47,374,362	10,478	--	47,107,000	10,419	--	99.4%	99.4%	--
Motor	203	18,963,225	3,091	--	18,917,289	3,081	--	100%	100%	--
Refrigeration	65	2,381,444	140	--	2,381,444	140	--	100%	100%	--
Agriculture	114	28,001	10	--	28,001	10	--	100%	100%	--
HVAC	47	1,804,764	741	86,867	1,804,623	741	86,867	100%	100%	100%
Kitchen	34	68,780	16	6,564	68,780	16	6,564	100%	100%	100%
Steam Trap	9	--	--	373,624	--	--	437,847	--	--	117%
Water Heater	2	--	--	40,437	--	--	41,628	--	--	103%
Total	**2,541**	**70,620,575**	**14,476**	**507,492**	**70,307,137**	**14,407**	**572,906**	**99.6%**	**99.5%**	**112.9%**

In developing these estimates, the team made two types of gross impact adjustments at the measure level to projects based on the participant telephone survey. These adjustments in the telephone survey sample included: 1) survey-based adjustments and 2) engineering review adjustments, which are described in detail below.

Survey-Based Adjustments

Based on the participant telephone survey, the team made two types of gross impact adjustments at the measure level to projects included in the telephone survey sample: 1) survey-based adjustments and 2) engineering review adjustments.

Survey-based adjustments were made after analyzing the answers provided by survey respondents to two types of questions: 1) questions on whether measures were installed as described (a quantity adjustment) and 2) questions on whether the measure claimed was compliant with eligibility requirements for the assignment of a fixed deemed value or a non-fixed value drawn from the AIC TRM. We did not make any adjustments based on questions relating to whether a measure was installed as described.

The team identified three projects for adjustment based on the determination that one or two measures were ineligible. This determination was made based on responses to the telephone survey, and a follow-up check of the AIB tracking system project records. The following is a summary of our findings:

- Ineligible: One project claimed T8 lighting as the baseline for one measure, but the deemed fixed value required a T12 baseline. No documents were found in AIB to refute the participant.
- Ineligible: One project claimed T8 lighting as the baseline for two measures, but the deemed fixed values required a T12 baseline. No documents were found in AIB to refute the participant.
- Ineligible: One project claimed T5 lighting as the baseline for two measures, but the deemed fixed values did not allow T5 lighting as a baseline. No documents were found in AIB to refute the participant.

Each of these projects was small in scope and we did not find post-inspection documents in AIB. However, because the projects were small in size, the impact on program's lighting realization rate was minor.

Database Adjustments

The engineering review of surveyed measures examined two issues: 1) whether the deemed fixed values were correctly implemented in the tracking system and 2) for measures that did not have deemed fixed values, whether savings were estimated correctly. The team made several adjustments based on the database review:

- In one project, the deemed per unit savings value used in the ex ante energy savings for a room air conditioner was incorrect for the reported size of equipment. On this measure, a deemed value of 788.49 kWh per unit was used in the tracking system, which is the deemed value for room air conditioners larger than 20,000 Btu/h. However, the size of the unit was recorded as 1.6 tons or 19,200 Btu/h. As a result, we adjusted the savings using a deemed value of 692.69 kWh per unit, which is the appropriate deemed value for room air conditioners between 14,000 Btu/h and 19,999 Btu/h. This adjustment resulted in a realization rate of 0.88 for this one measure.
- The deemed fixed value in the tracking system did not match the appropriate value from the

table of deemed fixed values for a 5-ton SEER 15 air conditioner in a grocery, resulting in a realization rate of 1.03 for this one project. The deemed fixed value used in the tracking system was 1,064.83 kWh per unit, but the appropriate value is 1,092.68 kWh per unit.

- The ex-ante savings calculation for measure BPL67 (LED lamps) did not include the default energy interactive effects in a warehouse facility, resulting in a realization rate of 1.06.
- The ex-ante savings calculation for measure BPL67 did not include the default energy interactive effects in a retail facility, resulting in a realization rate of 1.11.
- A steam trap measure in the tracking system showed a per unit savings value of 925 therms per unit that did not match the deemed fixed value appropriate for the system type. The deemed fixed value is 1,084 therms per unit, which resulted in a realization rate of 1.17 for the measure.
- A water heater measure was missing the total therm savings. As a result, the team added 569 therms to the ex post savings estimate.

Engineering Review Findings

This section provides the evaluation team's technical review of AIC's measure default savings for PY4 as documented in the *Act On Energy Business Program Technical Reference Manual Standard Measures, Revision 5, October 24, 2011,* for those measures that were not assigned fixed deemed values for PY4. Our review of the AIC TRM identified 18 unique measures without fixed values that were part of projects completed in PY4. Of the 18 measures not assigned fixed deemed values, 10 were reviewed by the evaluation team in PY3. As a result, the PY4 TRM review task focused on the eight measures new in PY4. The purpose of the review was to assess the underlying algorithms, assumptions, and calculated default savings proposed by AIC for these measures.

Below we summarize our findings and recommendations from the PY4 AIC TRM review:

- For the 10 measures without PY4 fixed deemed values that were reviewed in PY3, listed in the table below, the evaluation team did not adjust PY4 per unit impacts from default values provided in the PY4 AIC TRM. Claimed gross impacts for these measures were adjusted only if results from the telephone survey indicated adjustments for quantity or measure eligibility were necessary.

  Further, nine of the ten measures are included in the State of Illinois TRM,[12] and the evaluation team recommends that AIC adopt the State of Illinois TRM values for these measures for PY5 as planned. Only one measure continuing into PY5 is not in the State of Illinois TRM: measure BPH2-Gas Furnace Tune Up. The evaluation team initially recommended that AIC support deeming this measure through the Statewide TRM update process. However, we have learned that the program discontinued this measure as of October 15, 2012.

[12] *State of Illinois Energy Efficiency Technical Reference Manual*, Effective June 1, 2012, version September 14, 2012.

Table 38. Measures Introduced in PY3 without Fixed Deemed Values for PY4

AIC Measure Code	Measure Name
BPH2	Gas Furnace Tune-Up
BPH1	Gas Boiler Tune-Up
BPC21	Air Conditioner Tune-Up
BPH3, BPH4	Gas Boiler Replacement
BPH5, BPH6, BPH7	Gas Furnace Replacement
BPM1, BPM1B	VFDs
BPL43	T12 to T5 New Fluorescent Fixture
BPL44	T8 to T5 Relamp and Reballast
BPL50	Exterior Lighting
BPL51	Canopy Lighting w/electronic ballasts

Of the eight measures new in PY4, four are included in the State of Illinois TRM, while the remaining four are not covered in that document. The table below provides measure-specific findings and recommendations related to each of these measures. Ultimately, we adjusted only one of the eight measures discussed next.

Table 39. Review of New PY4 Measures

AIC Measure Code	Measure Name	Evaluation Findings and Recommendations
BPL67	LED Lamps	The AIC TRM algorithm provides a reasonable basis for the savings, but refers to these fixtures as interior lighting, while the table entries for interactive effects and coincident-diversity factors are consistent with exterior dusk-to-dawn lighting. We recommend using the State of Illinois TRM in PY5 for this measure. Evaluation adjustments were made to ex ante gross savings for this measure to include HVAC interactive effects.

AIC Measure Code	Measure Name	Evaluation Findings and Recommendations
BPC22	Air Cooled Chiller Tune-Up	The savings provided in the AIC TRM are reasonable for this measure. The AIC TRM appears to assume approximately 10% savings, which is consistent with the tune-up requirements including heat exchange surface cleaning, various chiller plant maintenance measures, and checking and repairing economizers. The evaluation team recommends that AIC support deeming this measure through the Statewide TRM update process. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.
BPCK9, BPCK10	Steamer (gas)	The savings provided in the AIC TRM are reasonable and per unit savings were not adjusted retrospectively in PY4. We recommend using the State of Illinois TRM in PY5 for these measures. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.
BPCK12	Fryer (gas)	
BPL68	Permanent Fixture Removal	The AIC TRM algorithm and assumptions for hours of use, interactive effects, and coincident-diversity factors provide a reasonable basis for estimating the per unit savings. The persistence factor is assumed to be one, with no reference provided. It is plausible that participants could add additional light fixtures to the same space at a later date to increase light levels. We recommend that AIC conduct secondary research on persistence for this measure. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.

AIC Measure Code	Measure Name	Evaluation Findings and Recommendations
BPL69	Permanent Lamp Removal	The AIC TRM algorithm and assumptions for hours of use, interactive effects, and coincident-diversity factors provide a reasonable basis for estimating the per unit savings. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.
BPL79	Remote mounted occupancy sensor	The AIC TRM algorithm and assumptions for hours of use, interactive effects, and coincident-diversity factors provide a reasonable basis for estimating the per unit savings. We recommend using the State of Illinois TRM assumptions and algorithms in PY5 for this measure. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.
BPL82	LED Exit sign Retro-fit Kit	The savings provided in the AIC TRM are reasonable. No evaluation adjustments to ex ante gross savings were made in PY4 on this measure.

Other Program Components

Table 40 presents the gross impacts from the Online Store, Green Nozzle and Direct Install offerings. Overall, the team's ex post gross impacts are lower than ex ante estimates. This is due to the results of the verification analysis, which found that a percentage of green nozzles and measures received through the Online Store are not installed and operating.

Table 40. Standard Program – Gross Impacts for Other Components

Program Component	Verified Participation	Ex Ante Gross			Ex Post Gross			Verification Rate		
		MWh	MW	Therm	MWh	MW	Therm	MWh	MW	Therm
Online Store	103,024	61,555 [a]	--	--	46,317	--	--	75%	N/A	N/A
Green Nozzle	874 [b]	5,087	--	1,097,600	4,629	--	988,971	91%	N/A	91%
Direct Install	18,678	635	--	363,731	635	--	363,731	100%	N/A	100%
Total	**122,576**	**67,277**	**--**	**1,461,331**	**51,580**	**--**	**1,352,702**	**77%**	**N/A**	**93%**

[a] Value differs slightly from the AIC tracking sheet (61,553 MWh) due to rounding.

[b] The verified number of nozzles is calculated by taking the 960 nozzles provided by AIC and multiplying by the verification rate of 91%.

Online Store

For the Online Store, the team calculated the savings that AIC can claim from the installation of free lighting in PY4, as well as the coming program years. As part of this process, the team made an adjustment in baseline savings for the EISA-impacted CFL bulbs included in the lighting kit. As documented in the Statewide TRM, the baseline for 100-watt equivalent CFLs drops to 72 watts. Based on this data, we have made the necessary adjustment to the banked savings for 100-watt equivalent CFLs distributed by the program in PY4, but installed in PY5 and PY6. Table 41 presents the resulting savings.

Table 41. Free Lighting Kit Yearly Gross Impacts

Free Kit Measure	1st Year Energy (kWh)	2nd Year Energy (kWh)	3rd Year Energy (kWh)
CFLs	15,435,572	4,008,188	2,732,855
LEDs	3,035,183	1,281,522	2,360,698
Total	**18,470,755**	**5,289,710**	**5,093,554**

Based on the PY4 savings from the free lighting kit, the Online Store achieved the following gross impacts in PY4.

Table 42. Online Store Gross Impacts

Measure Group	Verified Participation	Ex Ante Gross Impacts (MWh)	Ex Post Gross Impacts (MWh)	Verification Rate
Free Lighting Kits – CFLs	53,782	32,027 [a]	15,465	58%
Free Lighting Kits – LEDs	19,838		3,027	
Free CFLs (3 and 6 packs)	10,364	17,715	17,720	100%
Non-free CFLs, LED exit signs and LED exit sign retrofit kits	14,066	3,228	3,238	100%
Other Products	4,974	1,026	1,179	115%
Total [c]	**103,024**	**61,555** [b]	**46,317**	**75%**

[a] AIC used a single savings value for the lighting kit while the team had to use the measure specific values to determine ex post impacts.

[b] Value differs slightly from the AIC tracking sheet (61,553 MWh) due to rounding.

[c] Measure group savings do not sum to the total as both AIC and the team adjusted total Online Store savings to account for cooling effects (14%).

4.2.3 NET IMPACTS

In determining the overall net savings associated with the Standard Program, the team calculated net savings by project based on either the PY2 electric (0.72 for electric and 0.80 for gas) or the PY4 staffing grant NTGR where applicable.[13] As shown below, the Standard Program's overall net realization rate is 89% for electric energy, 101% for demand, and 98% for therms.

Table 43. Standard Program Net Impacts

Program Component	Ex Ante Net			Ex Ante NTGR [b]	Ex Post NTGR	Ex Post Net		
	MWh	**MW**	**Therms**			**MWh**	**MW**	**Therms**
Core Program	50,847	10	405,994	0.72	0.73 [a]	51,454	11	458,325
Online Store	49,244	--	--	0.80	0.80	37,053	--	--
Direct Install	508	--	290,985	0.80	0.80	508	--	290,985
Green Nozzle	4,171	--	900,032	0.82	0.82	3,796	--	810,956
Total	**104,770**	**10**	**1,597,011**			**92,811**	**11**	**1,560,266**
	Net Realization Rate					*0.89*	*1.01*	*0.98*

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

[a] While the team generally applied the PY2 NTGR for the program, the addition of PY4 staffing grant NTGRs for select participants affected the total ratio slightly.

[b] As stated above, the team applied the AIC ex ante NTG value of 0.8 for gas projects.

4.3 INPUTS FOR FUTURE PROGRAM PLANNING

In PY4, the evaluation team gathered data to update the Standard Program's NTGR for application in PY6. As a result, we conducted research with Core, Green Nozzle and Online Store participants to update existing NTGR values. Consistent with prior program years, the NTGR developed in PY4 is based on self-reported information from the CATI and Internet surveys that quantifies the percentage of the gross program impacts that can reliably be attributed to the program. Further, we calculated each of the NTGRs based on both the level of free ridership and participant spillover for the program. Appendix C provides detailed information about the methodology, as well as the results.

4.3.1 OVERALL PROGRAM NTGR FOR PY6

The following table provides the NTGR for the Standard Program overall for application in PY6.

Table 44. Overall Standard Program NTGR Inputs

[13] The team applied the PY2 electric NTGR to projects with gas and electric savings.

Program Component	Population Ex Post Gross		FR		SO		NTGR	
	MWh	Therms	kWh	Therms	kWh	Therms	kWh	Therms
Core Program	70,307	572,906	33%	24%	0.29%	20%	67%	96%
Online Store	46,317	--	36%	--	19%	--	83%	--
Green Nozzle	4,629	988,971	17%	21%	9%	10%	92%	89%
Overall Program	**121,253**	**1,561,877**	**34%**	**22%**	**8%**	**13%**	**74%**	**91%**

As shown in Table 45, the program NTGR is 0.74 for electric impacts and 0.91 for gas impacts.

Table 45. Overall Standard Program NTGR

Components	kWh	Therm
FR	0.34	0.22
SO	0.08	0.13
NTGR	**0.74**	**0.91**

Each of the following sections outlines the NTGR by program component. In addition, Appendix C provides detailed information regarding the methodology and findings.

Standard Program NTGR

The following table presents the results of our PY4 data collection to inform an updated Core program NTGR for application in PY6. For the first time, we provide both gas and electric NTGRs where applicable.

Table 46. Standard Program Core NTGR Results

End Use	PY2 NTGR	PY3 NTGR	PY6 NTGR	
	Electric Only	Electric Only	Electric	Gas
Lighting	0.78	0.76	0.62	--
HVAC	0.47	0.78	0.43	0.60
Motor	0.63	0.76	0.80	--
Refrigeration	0.90	0.82	0.83	--
Agriculture	N/A	0.76	0.76	
Commercial Kitchen	N/A	N/A	0.54	0.53
Steam Trap[a]	N/A	N/A	--	0.80
Water Heater	N/A	N/A	--	0.73
Core Program (FR Only)	**0.72**	**0.77**	**0.67**	**0.76**
Spillover	**--**	**--**	**0.003**	**0.20**
Overall Core Program (FR+SO)	**0.72**	**0.77**	**0.67**	**0.96**

[a] Due to the small sample size and number of completes for this end-use, the team applied the ex ante NTGR used by AIC for this measure.

Green Nozzle NTGR

Table 47 presents the results of our PY4 data collection to inform an updated Green Nozzle NTGR for application in PY6. We provide a single NTGR for the program given that there was insufficient data to support the development of a separate gas and electric NTGR. As a result, the updated NTGR is based on BTU savings values.

Table 47. Green Nozzle NTGR

Measure	PY2 NTGR	PY6 NTGR
Green Nozzle	0.82	0.89

Online Store NTGR

We performed NTGR research with participating customers to determine specific NTGRs based on whether the customer purchased products online versus requesting and receiving free lighting kits.[14] In particular, we asked questions about a number of products available through the online store including spiral and specialty CFLs, and LED exit signs. However, the base sizes for spiral and specialty CFLs, as well as for LED exit signs and retrofit kits, were insufficient to develop independent net-to-gross ratios for those product categories. Therefore, we weighted the free ridership scores for each of those product categories by the energy savings that each product category contributes to the online store total to arrive at the aggregated free ridership score shown in Table 48.

Table 48. Online Store NTGR

Program Year	Overall NTGR
PY2	0.80
PY4	0.83

We provide detailed information regarding the methodology used to develop the NTGR, as well as data on the three free ridership scores that are included in the overall value in Appendix C.

Overall, the three free ridership scores that the team calculated are:

- Free CFL products obtained either through filling out and mailing a coupon or online
- Free LED products obtained either through filling out and mailing a coupon or online
- CFL and LED exit sign products purchased through the online store

[14] Free lighting kits refers to the package of 4 CFLs and 2 LEDs provided in PY4, as well as the 6 free CFLs and 3 free CFLs provided mainly in PY3, but that trickled into PY4.

A. APPENDIX: DATA COLLECTION INSTRUMENTS

AIC PY4 Online Store Survey FINAL.pdf

AIC PY4 C&I Prescriptive Survey F

B. APPENDIX: SURVEY RESPONSE RATE METHODOLOGY

Given that survey response rates are calculated and presented for all the program surveys, we present a definition and explanation of how the rate is calculated here. The survey response rate is the number of completed interviews divided by the total number of potentially eligible respondents in the sample. We calculated the response rate using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).[15] For various reasons, we were unable to determine the eligibility of all sample units through the survey process and chose to use AAPOR Response Rate 3 (RR_3). RR_3 includes an estimate of eligibility for these unknown sample units. The formulas used to calculate RR_3 are presented below. The definitions of the letters used in the formulas are displayed in the Survey Disposition tables below.

$$E = (I + R + NC) / (I + R + NC + e)$$

$$RR_3 = I / ((I + R + NC) + (E*U))$$

We also calculated a cooperation rate, which is the number of completed interviews divided by the total number of eligible sample units actually contacted. In essence, the cooperation rate gives the percentage of participants who completed an interview out of all of the participants with whom we actually spoke. We used AAPOR Cooperation Rate 1 ($COOP_1$), which is calculated as:

$$COOP_1 = I / (I + R)$$

The approach to calculating response rates differs slightly for Internet based surveys. In these instances, the survey response rate is the number of completed surveys divided by the total number of potentially eligible respondents in the sample. The quality of the email list is a key factor in determining the eligibility of participants who do not respond to the email but also do not bounce back. This calculation assumes a high-quality list in which all respondents are eligible except those who reply with an accepted reason why they are not eligible (e.g., employee of client).

[15] *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*, AAPOR, 2011. http://www.aapor.org/AM/Template.cfm?Section=Standard_Definitions2&Template=/CM/ContentDisplay.cfm&ContentID=3156

C. APPENDIX: NTGR RESULTS

In PY4, the evaluation team was tasked with gathering data to update the Standard Program's NTGR for application in PY6. As a result, we conducted research with Core and Online Store participants to update existing values. Consistent with prior program years, the NTGR developed in PY4 is based on self-reported information from the CATI and Internet surveys that quantifies the percentage of the gross program impacts that can reliably be attributed to the program. Further, as in prior years, the Standard Program NTGR was calculated based on both the level of free ridership and participant spillover for the program. We also quantified spillover for the Online Store for the first time in PY4.

Methodology

Core Standard Program

Free Ridership

Free riders are program participants who would have implemented the incented energy efficient measure(s) even without the program. These estimates are based on a series of questions that explore the influence of the program in making the energy efficient installations as well as likely actions had the incentive not been available. For the majority of Standard projects included in the surveys, we developed a net-to-gross factor that consists of three scores: overall influence, influence of program components, and influence of program timing.[16]

1. **Overall influence**. This score is based on two survey questions. The first question asked respondents to rate the importance of the program compared to the importance of other factors, in their decision to implement the energy efficient equipment. To do so, respondents were asked to divide 100 points between program and non-program factors. This score is equal to the number of points given to the program divided by 10. The second question asked if respondents had learned about the program before or after they decided to implement the energy efficient equipment rather than standard efficiency equipment. If respondents learned about the program after deciding to install energy efficient equipment, the value from the first question (the total points given divided by 10) is halved. As a result, greater importance of the program means lower level of free ridership.

   For example, if a respondent gave the program 70 points out of 100, the first component of the overall influence score would be 7 (70/10). If that same respondent said they learned about the program before they decided to implement the energy efficient equipment, their score would remain a 7. However, if they said they learned about the program after they decided to implement the energy efficient equipment, their score would be divided in half and equal 3.5 (7/2)

2. **Influence of program components**. This score is based on a series of four questions. These questions asked respondents to rate the importance of four program components, on a scale of 0 to

[16] This algorithm is based on the basic rigor self-report method used in California and is the same method used for the ComEd C&I programs.

10 (where 0 is not at all important and 10 is very important): the incentive amount, program marketing materials, recommendation from program staff, and recommendation from a utility account manager. This score is equal to the highest rating given to any one of these components. Greater importance of the program components means lower level of free ridership.

In this case, if a respondent rated the program rebate 10 out of 10, the recommendation of program staff 8 out of 10, and the information from program materials 8 out of 10, the final Influence of Program Components score would be a 10 (the highest of all the scores given).

3. **Influence of program timing.** This score is developed based on three questions: 1) the likelihood that the exact same equipment would have been installed without the program (on a scale of 0 to 10); 2) if the installation would have been done at the same time without the program; and 3) if the installation would have been done later, how much later. This score takes the response to the likelihood question and adjusts this value by the responses to the timing questions. A greater likelihood of participating without the program means higher level of free ridership. Later implementation without the program means lower level of free ridership.

   For example, if the participant says they would have installed the same equipment at the same time, they are considered a full free rider for this part of our net-to-gross index. If they likely would have installed the equipment (a rating between seven and ten) but would have done it later, they are considered a partial free rider and the influence of the program is higher. Information about how much later (determined by question #3) helps us to assign a free ridership value. If the customer would not have installed the same equipment until four years later, we do not consider them a free rider for this component of the net-to-gross index (i.e., the program is given full influence on the timing of the installation).

Each score can take on a value of 0 to 10, where a higher score means a lower level of free ridership. The overall net-to-gross factor for a project is the average of the three scores, divided by 10. The net-to-gross factor for each project thus ranges from 0 (100% free ridership) to 1 (no free ridership).

For larger projects, this approach is supplemented with findings from interviews with trade allies where the participant indicates they played an important role in their decision to participate in the program.[17] There were 10 Standard Rigor NTG projects in PY4, and survey responses from two projects required interviews with trade allies or a Key Account Executive. Two different analysts assessed the data from these projects, including findings from in-depth interviews, and arrived at independent NTG values. After a discussion of the values, the analysts reached an agreement for each project. Ultimately, the team did not update any of the NTG scores.

A NTGR, weighted by the ex post kWh of the surveyed projects, was applied to the population-level gross impacts to determine the program's net impact before any spillover was included.

[17] Projects with estimated ex ante kWh savings of 750,000 kWh or more were assessed under this Standard rigor approach.

Participant Spillover

We examined spillover in projects of all end uses using participant responses to the phone survey, as well as callbacks. Based on this data, we found spillover among six Standard Program participants in the AIC service territory. We conducted an engineering assessment of participant responses and gathered additional information via follow-up interviews to determine the savings associated with measures installed outside of the program.

Online Store

The team used a different approach for determining what AIC customers would have done absent this program intervention (i.e., the online store). This is because free lighting kits provided through the online store were a large component of the store's impacts, and that the Core Standard algorithm is inappropriate for this program scenario. Additionally, participating customers could have chosen to purchase the same equipment at a store in their community, which is a different type of action requiring a different line of questioning to determine program attribution.

Free Ridership

Online store free riders are program participants who would have purchased energy efficient measures without the program incentives. Free ridership estimates are based on a series of questions that explore the influence of the program in making energy efficient purchases, as well as likely alternative purchases had the incentives not been available. Given their contribution to overall online store savings, we asked participants specifically about free lighting kits, as well as spiral CFLs purchased through the online store. We also asked participants about specialty CFLs, and LED exit signs given that these measures had the next highest purchase levels.

We developed a free ridership factor for all respondents who received free lighting (spiral CFLs and LEDs), spiral and specialty CFLs, and LED exit signs, which consists of three components: influence of the program on product efficiency, influence on quantity and an adjustment for the timing of purchase.

1. **Program Influence on Efficiency**. This component is based on a single survey question that asked respondents if they would have purchased the same or less efficient products if the opportunity to purchase the products online had not been available. Those respondents who would have purchased less efficient products (e.g., incandescent light bulbs instead of CFLs, incandescent exit signs instead of LED exit signs, etc.) exhibit no free ridership, while those who would have purchased the same type of products exhibit a higher level of free ridership (i.e., a lower level of attribution to the program) and are asked a follow-up question about product quantity.

2. **Program Influence on Quantity.** This component is based on a question asking those who would have purchased energy efficient products without the program whether they would have purchased the same number or fewer products (given product pricing) absent the program.[18]

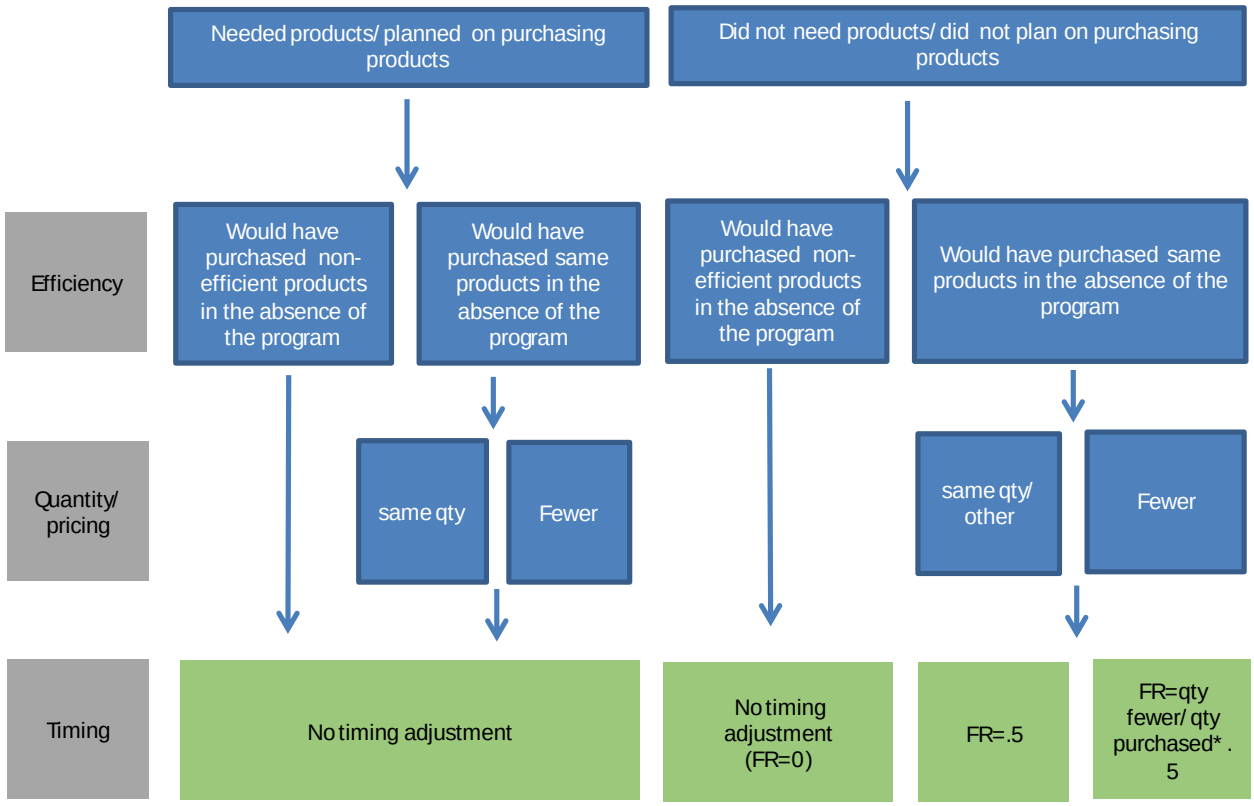
[18] Respondents who received free CFLs as part of the online store promotion were asked about the quantity of CFLs that would have been purchased if free CFLs were not offered.

Those respondents who would have purchased fewer products without the program are considered partial free riders, while respondents who would have purchased the same quantity of energy efficient products are considered full free riders. The level of free ridership for partial free riders is calculated by determining the proportion of products that cannot be attributed to the program. This proportion equals the ratio of product quantity that the customer would have purchased outside of the program to the quantity of products that the customer purchased through the program.

3. **Timing Adjustment Factor.** This component provides an adjustment based on the timing of a customer's product purchase for respondents who also said they would have purchased energy efficient products absent the program. Respondents are asked whether, at the time they learned about the online store and its offerings, they needed products right away and/or intended to buy products at that time or not. The level of adjustment is then calculated based on other survey responses:
    a. We applied an adjustment of 0.5 for those who did not need products right away or did not plan on purchasing products when they learned about the program, AND said that they would still have purchased the same quantity of energy efficient products absent the program.
    b. For those who did not need products right away or did not plan on purchasing products when they learned about the program, AND would have purchased fewer products in the absence of the program, we calculated the level of free ridership by determining the proportion of savings that cannot be attributed to the program. This proportion equals the ratio of product quantity that the customer would have purchased outside of the program to the quantity of products that the customer purchased through the program.[19] Figure 6 below provides a visual depiction of the computation behind the timing adjustment.

[19] In our sample, some respondents provided unclear answers to one or more questions in the free ridership module. For those respondents, if present, partial data were used to arrive at the free ridership factor. If all core data were missing, those respondents were excluded from the analysis.

Figure 6. Online Store Timing Adjustment Algorithm



Spillover

In addition to assessing free ridership, the evaluation team assessed participant spillover resulting from the online store. For this survey, we asked if customers purchased and installed any other energy efficient equipment or products without discounts from AIC. We asked those who did to rate the influence of the online store program on their decision to take those additional energy saving actions.

We found that 27 of the surveyed decision-makers who purchased and installed energy efficient measures without an incentive from AIC were influenced to do so by the program. Participants reported installing CFLs, LEDs and LED exit signs. As a result, our evaluation found both gas and electric spillover savings.

Green Nozzles

Free Ridership

Within the Green Nozzle Program, free riders are program participants who would have installed the nozzles provided to them even without the program. We base the free ridership estimate on a series of questions that explore the influence of the program in installing the nozzles, as well as likely actions had these measures not been available. For each respondent included in the survey, we develop a free ridership factor that consists of an overall program influence score, which is adjusted for quantity, and timing of installation:

1. **Program Influence – Concept 1.** This score reflects the degree of influence the program had on the customer's decision to install the green nozzle. This score is based on a single survey question that asks respondents whether they would have purchased a green nozzle on their own if they had not received one from Ameren Illinois.

    - Those who would not have purchased a nozzle independently are considered highly influenced by the program (FR=0).

    - Those who would have purchased a nozzle on their own are considered not to have been influenced by the program (FR=1).

2. **Program Influence – Concept 2.** This factor adjusts the overall free ridership score based on earlier installation of the measures due to the program and for an increase in the quantity of the measures installed compared to what the participant would have done on their own. It is based on two questions we ask respondents who said they would have purchased energy efficient low flow pre-rinse water nozzles without the program:

    a. The first asks whether, absent the program, they would have purchased fewer, the same number, or more nozzles on their own within the next year.

    b. The second asks respondents when they would have purchased energy efficient low flow pre-rinse water nozzles on their own (four categories of time intervals).

    The responses to the two questions are multiplied together and then averaged with Concept 1 to create an overall free ridership score. (Note that this concept can reduce the level of free ridership, but not increase it. If the respondent indicates that they would have installed the same number of nozzles or more at roughly the same time without the program, Concept 2 is 1, and the overall free ridership score is the same as Concept 1.)

The free ridership score for each respondent thus ranges from 0 (0% free ridership, 100% program attribution) to 1 (100% free ridership, 0% program attribution).

Spillover

Our evaluation found some participant spillover associated with the program — eight participants took energy saving actions that were influenced by the program, but for which they did not receive an incentive. In general, respondents reported installing CFLs, T8 lamps, LED exit signs, and one room AC. These actions resulted in quantifiable spillover savings of 7% of program component therm savings. In addition, the team identified electric spillover savings, which are presented in the Overall Program Results section.

Overall Standard Program Results

The following table provides the NTGR for the Standard Program overall. As presented below, we combined each of the program components to estimate a new overall NTGR.

The team incorporated the spillover savings the NTGR of the Standard Program by adding spillover savings to the ex post net savings for each program component. The team then uses this total program savings to calculate an updated NTGR for the program by dividing the total program ex post net

savings (including spillover) by the ex post gross program savings.

Table 49. Overall Standard Program NTGR Inputs

Program Component	Population Ex Post Gross		FR		SO		NTGR	
	MWh	**Therms**	**kWh**	**Therms**	**kWh**	**Therms**	**kWh**	**Therms**
Core Program	70,307	572,906	33%	24%	0.29%	20%	67%	96%
Online Store	46,317	--	36%	--	19%	--	83%	--
Green Nozzle	4,629	988,971	17%	21%	9%	10%	92%	89%
Overall Program	**121,253**	**1,561,877**	**34%**	**22%**	**8%**	**13%**	**74%**	**91%**

As shown in Table 50, the program NTGR is 0.74 for electric impacts and 0.91 for gas impacts. We provide additional detail on each of the program components in the following sections.

Table 50. Overall Standard NTGR

Components	kWh	Therms
FR	0.34	0.22
SO	0.08	0.13
NTGR	**0.74**	**0.91**

Standard Program NTG

The following table presents the results of our PY4 data collection to inform an updated Core program NTGR for application in PY6. For the first time, we provide both gas and electric NTGRs where applicable.

Table 51. Standard Program Core NTGR Results

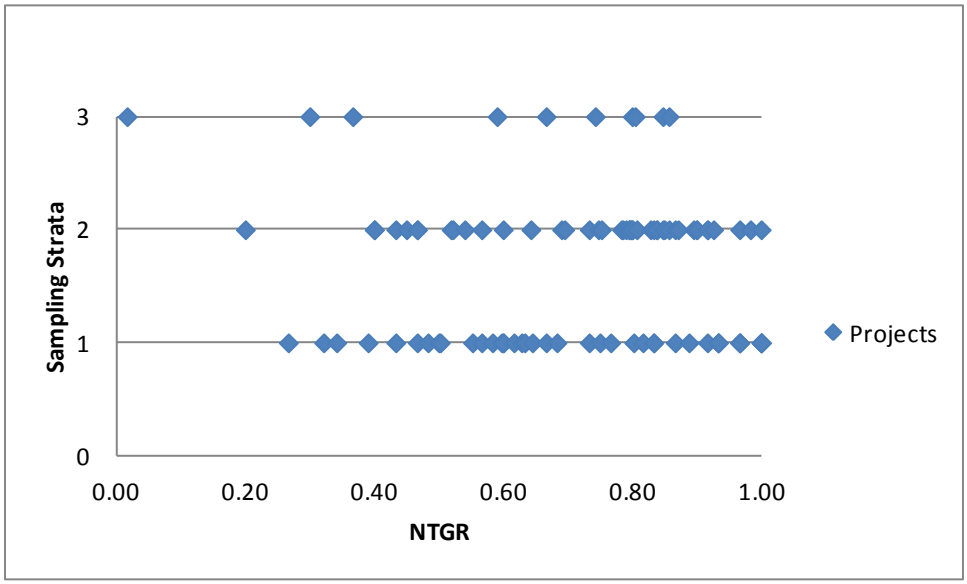
End Use	PY2 NTGR	PY3 NTGR	PY6 NTGR	
	Electric Only	**Electric Only**	**Electric**	**Gas**
Lighting	0.78	0.76	0.62	--
HVAC	0.47	0.78	0.43	0.60
Motor	0.63	0.76	0.80	--
Refrigeration	0.90	0.82	0.83	--
Agriculture	N/A	0.76	0.76	
Commercial Kitchen	N/A	N/A	0.54	0.53
Steam Trap[a]	N/A	N/A	--	0.80
Water Heater	N/A	N/A	--	0.73
Core Program (FR Only)	**0.72**	**0.77**	**0.67**	**0.76**
Spillover	**--**	**--**	**0.003**	**0.20**
Overall Core Program (FR+SO)	**0.72**	**0.77**	**0.67**	**0.96**

[a] Due to the small sample size and number of completes for this end-use, the team applied the ex ante NTGR used by AIC for this measure.

Overall, the team saw a higher level of free ridership for lighting projects compared to prior program years. However, this result is due to a small number of large lighting projects with low NTGRs as

opposed to trends within the participant population. As the NTGR is weighted by ex post kWh savings, these large sites drive the NTGR down for the entire program. Figure 7 below illustrates these results. Note that strata three contains the largest lighting projects followed by medium projects in strata two and small projects in strata one.

Figure 7. Standard Lighting Project NTGRs by Strata



Among the large lighting projects driving the PY4 lighting NTGR, all provided low scores for the influence of program factors on their decision to implement the measure. In addition, all said they were highlight likely to have installed the exact same equipment in the absence of the program.[20] One of the largest projects in this group also explicitly stated that they would have installed the same equipment at the exact same time.

Green Nozzle NTG

The following table presents the results of our PY4 data collection to inform an updated Green Nozzle NTGR for application in PY6. Please note that the FR and SO components listed in Table 52 result in a slightly different NTGR than the overall score provided. This is because we combined electric and gas results to develop an overall BTU based value.

Table 52. Green Nozzle NTG

Component	PY2 NTGR	PY6 NTGR
FR	0.18	0.21
Spillover	--	0.10
Overall Score	**0.82**	**0.89**

[20] A score of 8-10 on a 10 point scale where 0 is "not at all likely" and 10 is "extremely likely".

Online Store

For the Online Store, we performed NTGR research with participating customers to determine specific NTGRs based on whether the customer purchased products online or requested and received free lighting kits.[21] As outlined in the Methodology Section, we asked questions about a number of products available through the online store including spiral and specialty CFLs, and LED exit signs. However, the base sizes for spiral and specialty CFLs, as well as for LED exit signs and retrofit kits, were insufficient to develop independent NTGRs for those product categories. As a result, we developed an aggregated free ridership score by weighting the free ridership scores for each of the product categories by their contribution to the energy savings of the online store overall.

In general, the team calculated three free ridership scores:

- Free CFL products obtained either through filling out and mailing a coupon or online
- Free LED products obtained either through filling out and mailing a coupon or online
- CFL and LED exit sign products purchased through the online store

As Table 53 presents, we found different levels of free ridership among those who purchased products through the online store and those who simply responded to a free lighting coupon offer in the mail or requested free CLFs or LEDs through the online store website. The evaluation team ran statistical tests of the free CFL and free LED scores to determine if statistically significant differences existed across the two values and the exercise did in fact identify such differences between the two scores.[22] For those product categories offered through the online store, but for which we receive no survey responses, the team recommends the assignment of the AIC planning value, which is a NTGR of 0.8.

Table 53. Online Store NTGR

Product Category	Ex Post Gross Savings	PY4 NTGR	Ex Post Net Savings
Free CFLs	33,184,633	0.61	20,242,626
Free LEDs	3,027,248	0.88	2,663,978
Non-free CFLs, LED exit signs and LED exit sign retrofit kits	3,238,315	0.71	2,299,204
Other products	1,178,502	0.80	942,802
Total (FR Only) *	**46,316,716**	**0.64**	**29,809,415**
Spillover		**0.19**	
Overall NTGR		**0.83**	

* Note: Both AIC and the team adjusted Online Store savings to account for cooling effects (14%).

[21] Free lighting kits refers to the package of 4 CFLs and 2 LEDs provided in PY4, as well as the 6 free CFLs and 3 free CFLs provided mainly in PY3, but that trickled into PY4.

[22] The evaluation team chose to use the Wilcoxon rank-sum non-parametric test. The results of the Wilcoxon rank-sum test indicate that there is a significant difference in free ridership scores between the two categories of free lighting products.

D. APPENDIX: IMPLEMENTATION MODEL

The evaluation team created an implementation model for the Standard and Custom programs evaluated in PY4. An implementation model is a graphic presentation of the intervention—what occurs and who undertakes the functional activities of the program. The model is displayed using a multi-level Visio document that has various functions in its rows, and key stakeholders and populations in the columns. We determined the functions, stakeholders, and processes through a review of the available program documentation and further refined them based on interviews with program staff. This model does not attempt to assess the effects of the program.

The model is organized by function and the stakeholders involved.

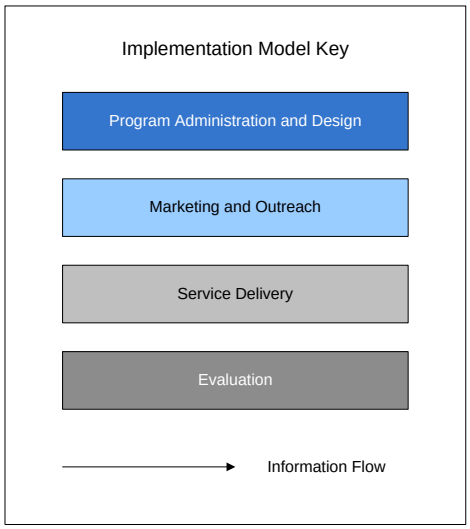
- Functions: These represent the discrete functions inherent to the program. These functions include program administration and design, marketing and outreach, service delivery, and evaluation. Service delivery encompasses activities that are directed towards intervention recipients and, for this model, is a catchall for any activity not included in the other functions.
- Stakeholders: These include the various entities that are involved in program delivery or receive program services. Stakeholders include the customer, program allies or market actors, AIC, and sub-contractors SAIC and GDS.
- For these programs, we include an additional "application process flow model" that documents a specific aspect of the service delivery processes in greater detail.

For the C&I Standard and Custom programs, key program functions include:

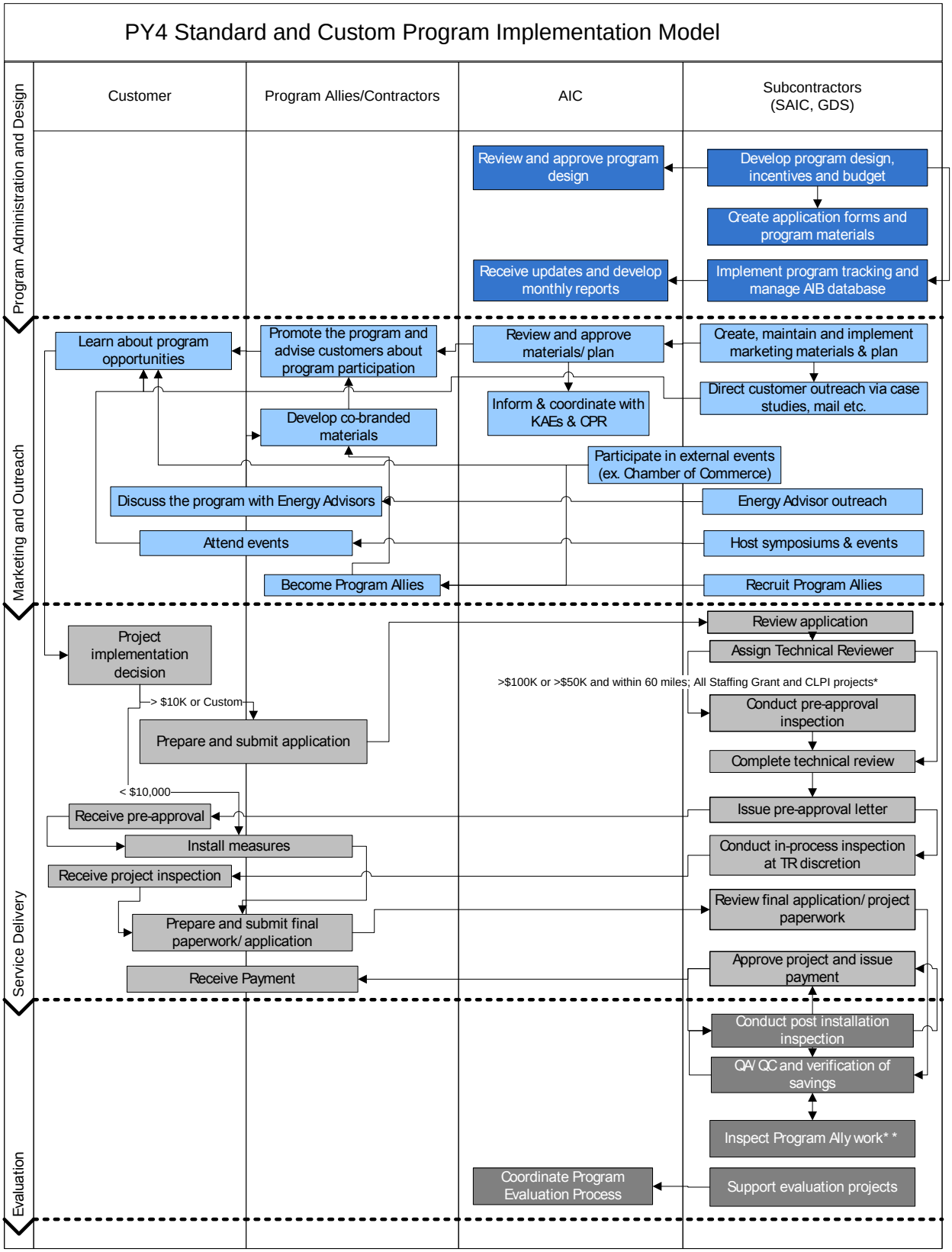
- **Program Administration and Design**: Utility and implementer staff work together to establish the program design, budget, and implementation plan for the Standard and Custom programs. SAIC then takes the lead in developing the application materials and tracking mechanisms required to effectively manage the program. As part of the latter activity, SAIC also works closely with GDS, the developer of the business program database called AIB.
- **Marketing & Outreach**: Both SAIC and AIC are actively involved in marketing the ActOnEnergy program. While SAIC develops the marketing materials and overall strategy, AIC is engaged in the process and works independently to keep internal stakeholders such as the Key Account Executives (KAEs) and Corporate Public Relations (CPR) informed about the program. As part of marketing and outreach efforts, SAIC also recruits market actors to serve as official program allies, and draws upon Energy Advisor staff to meet directly with Ameren customers about program opportunities.
- **Service Delivery**: SAIC is the key actor involved in service delivery and works directly with the customer and/or program ally or contractor involved in the project. As part of this process, SAIC thoroughly reviews all project documentation both at an administrative and technical level to assure that project quality is high and all necessary documentation is provided. This occurs specifically through the pre-approval, in-process, and final application review.

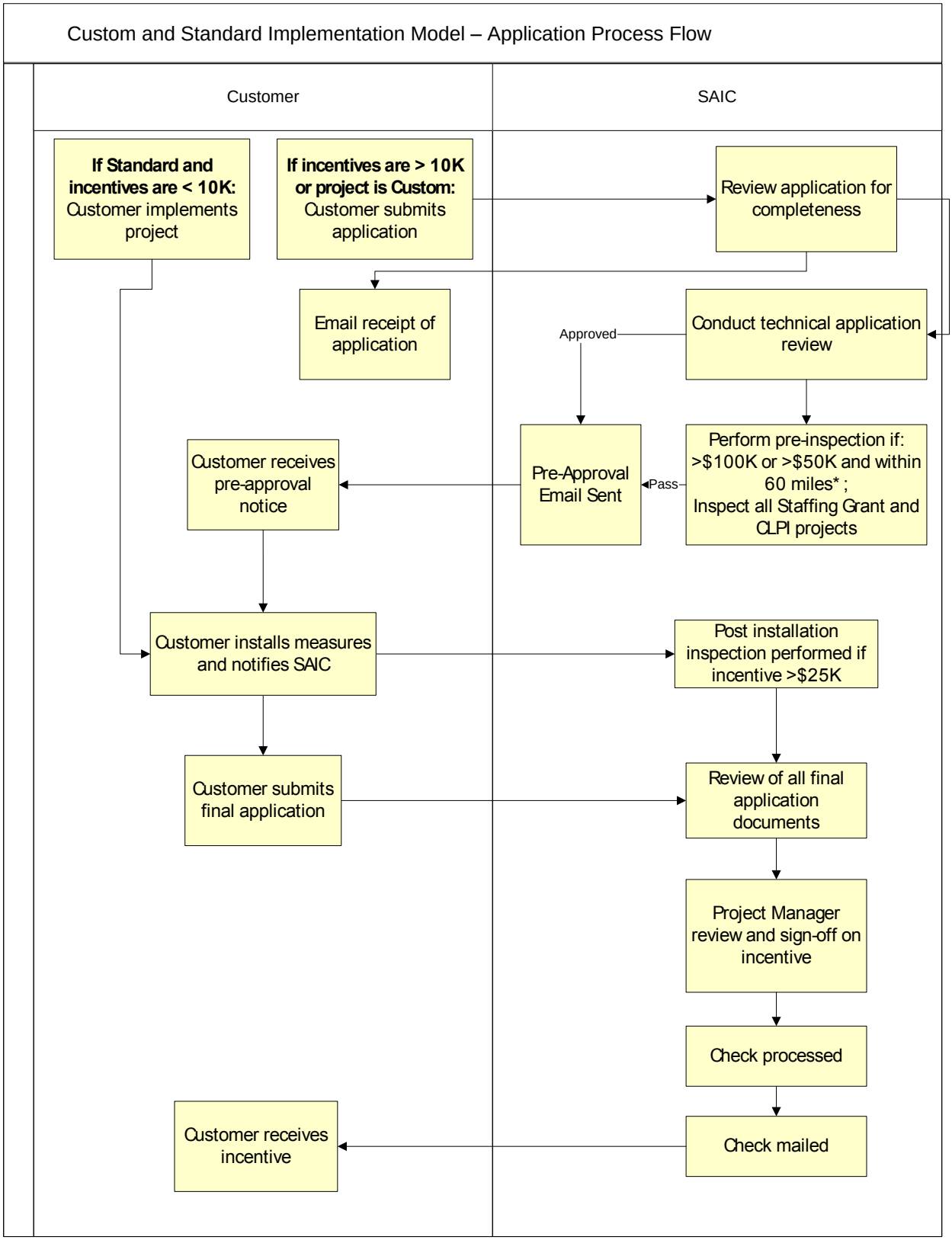
- **Evaluation**: As part of the program's Quality Assurance and Quality Control (QA/QC) procedures, SAIC conducts post installation inspections[23] of designated projects and also conducts internal verification of project savings via the technical review process. In addition, SAIC actively works to support the third-party evaluation process by providing program data and additional information about key C&I projects. AIC also works to coordinate the evaluation process and ensure that both program staff and the evaluation team are on the same page.

Below we provide the Standard and Custom Program implementation model.



[23] Post-installation inspections are required for projects requesting incentives of more than $25,000.


PY4 Standard and Custom Program Implementation Model
Customer
Program Allies/Contractors
AIC
Subcontractors (SAIC, GDS)
Program Administration and Design
Marketing and Outreach
Service Delivery
Evaluation
Review and approve program design
Develop program design, incentives and budget
Create application forms and program materials
Receive updates and develop monthly reports
Implement program tracking and manage AIB database
Learn about program opportunities
Promote the program and advise customers about program participation
Review and approve materials/ plan
Create, maintain and implement marketing materials & plan
Direct customer outreach via case studies, mail etc.
Inform & coordinate with KAEs & CPR
Develop co-branded materials
Participate in external events (ex. Chamber of Commerce)
Discuss the program with Energy Advisors
Energy Advisor outreach
Attend events
Host symposiums & events
Become Program Allies
Recruit Program Allies
Review application
Project implementation decision
Assign Technical Reviewer
>$100K or >$50K and within 60 miles; All Staffing Grant and CLPI projects*
> $10K or Custom
Conduct pre-approval inspection
Prepare and submit application
Complete technical review
< $10,000
Issue pre-approval letter
Receive pre-approval
Install measures
Conduct in-process inspection at TR discretion
Receive project inspection
Review final application/ project paperwork
Prepare and submit final paperwork/ application
Approve project and issue payment
Receive Payment
Conduct post installation inspection
QA/ QC and verification of savings
Inspect Program Ally work* *
Coordinate Program Evaluation Process
Support evaluation projects


Custom and Standard Implementation Model – Application Process Flow
Customer
SAIC
If Standard and incentives are < 10K: Customer implements project
If incentives are > 10K or project is Custom: Customer submits application
Review application for completeness
Email receipt of application
Approved
Conduct technical application review
Customer receives pre-approval notice
Pre-Approval Email Sent
Pass
Perform pre-inspection if: >$100K or >$50K and within 60 miles* ; Inspect all Staffing Grant and CLPI projects
Customer installs measures and notifies SAIC
Post installation inspection performed if incentive >$25K
Customer submits final application
Review of all final application documents
Project Manager review and sign-off on incentive
Check processed
Customer receives incentive
Check mailed